NOLOGY DEPT.

Gas Journal

VOL. 290. 109th YEAR. LONDON, APRIL 24, 1957. No. 4893. PRICE 1/6

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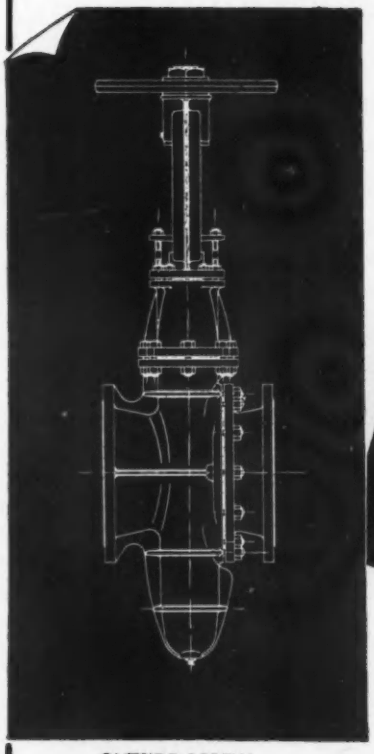

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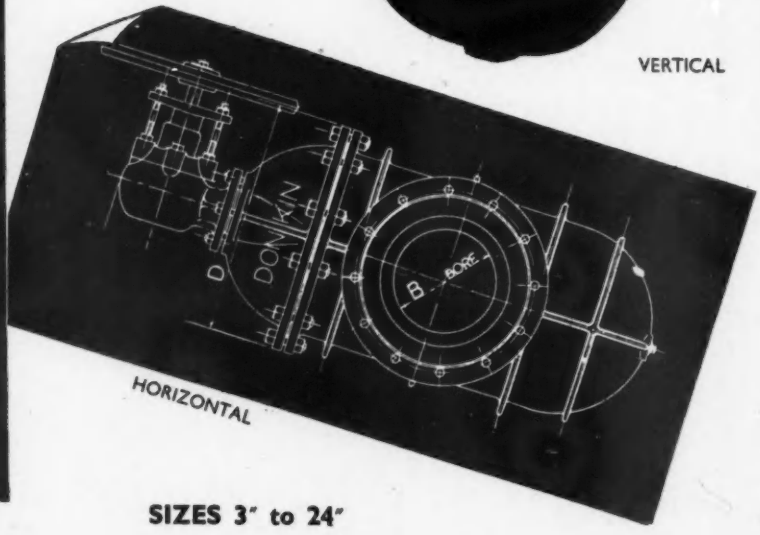

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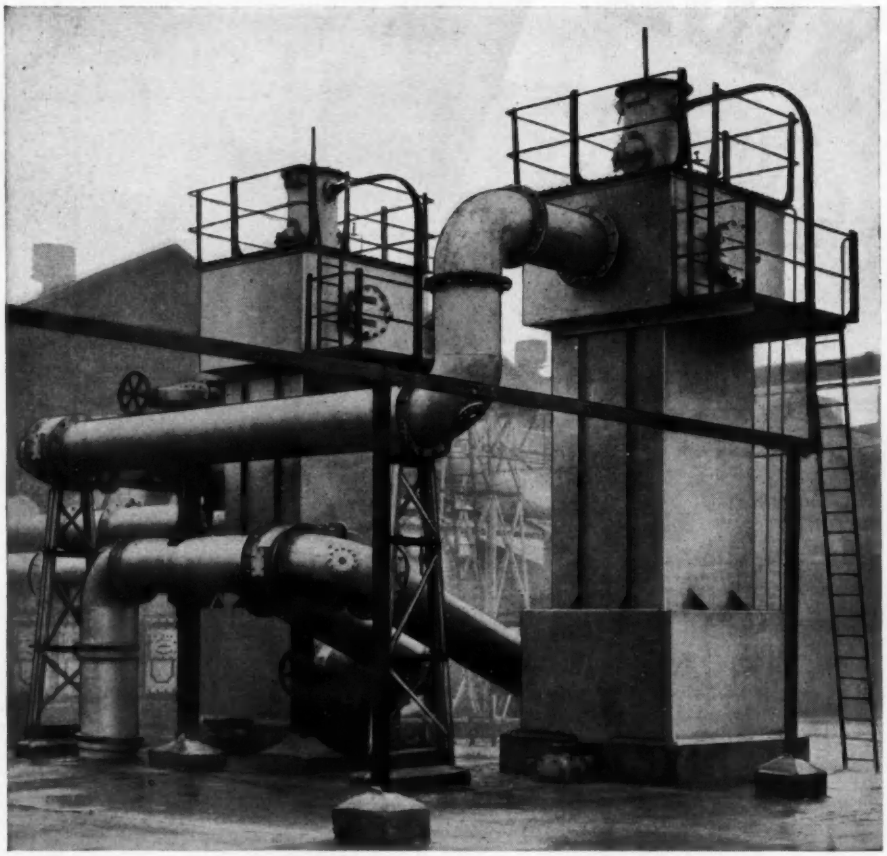

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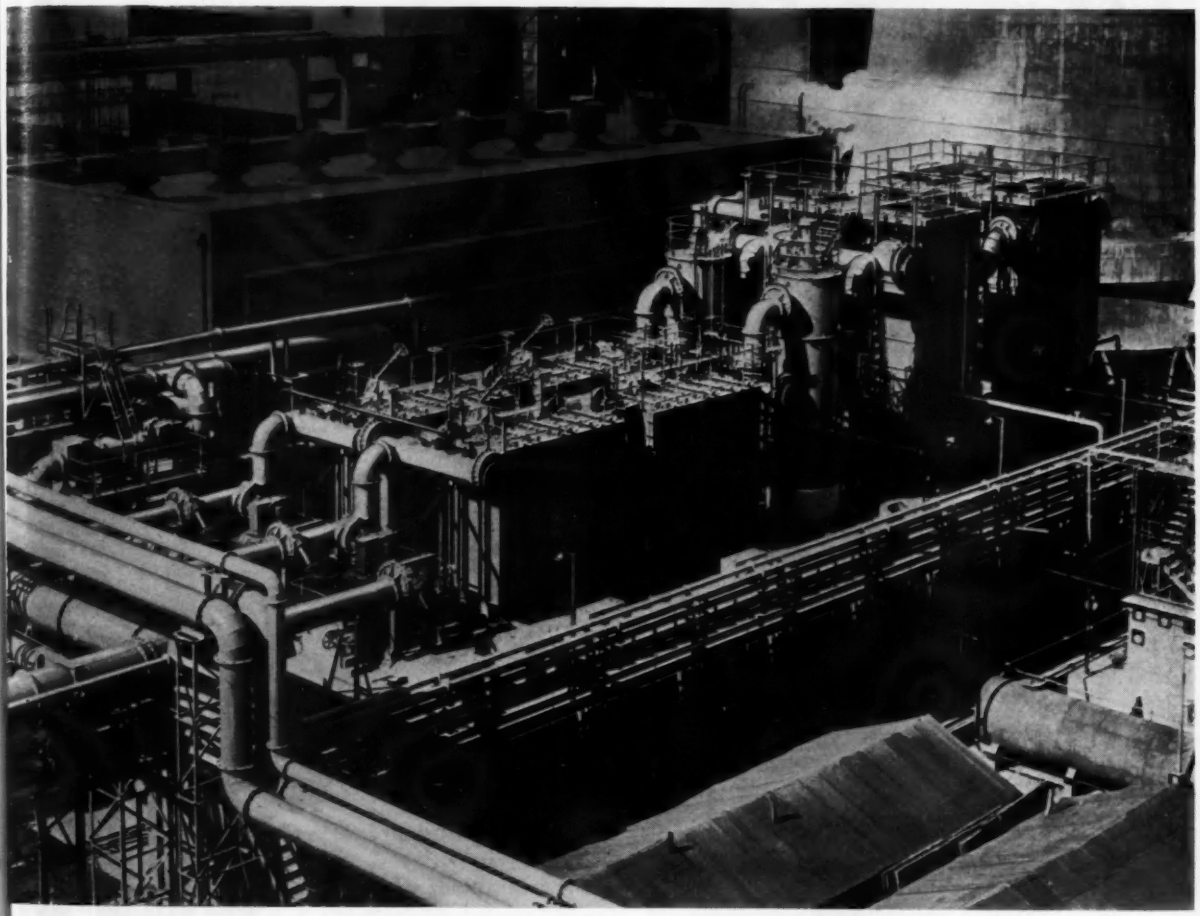

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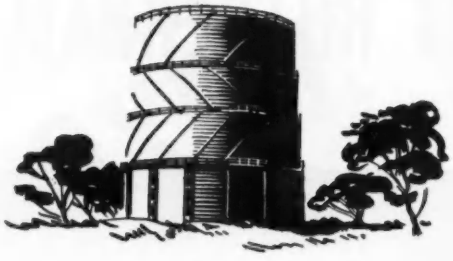

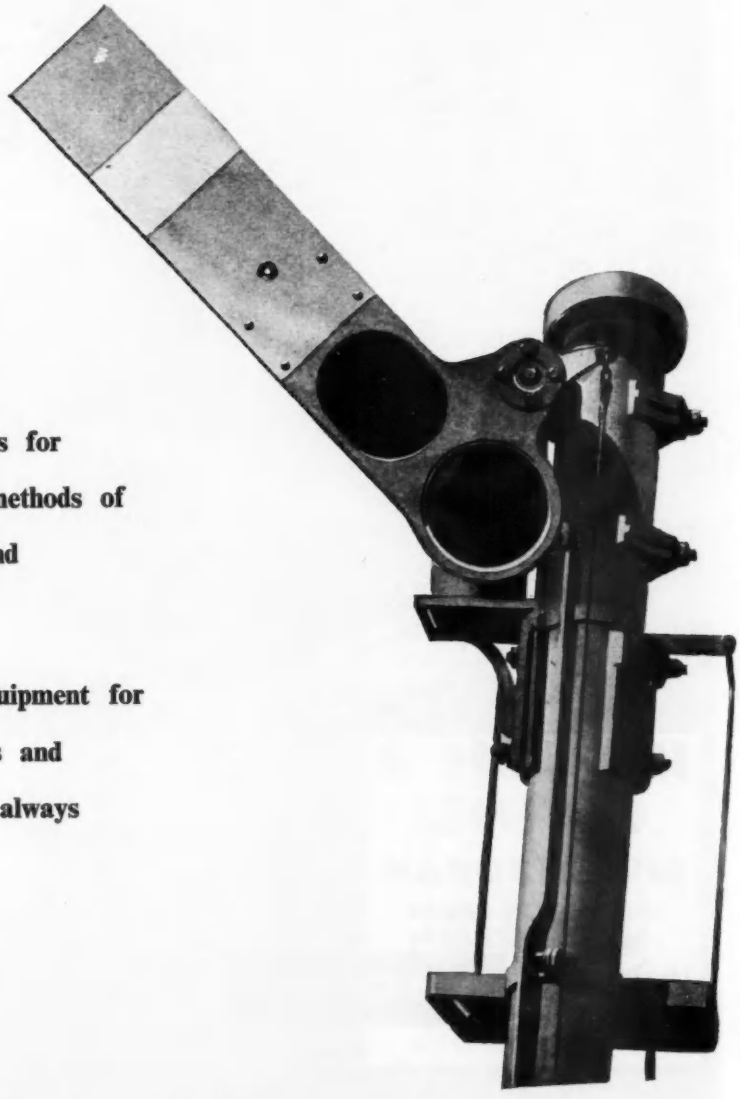

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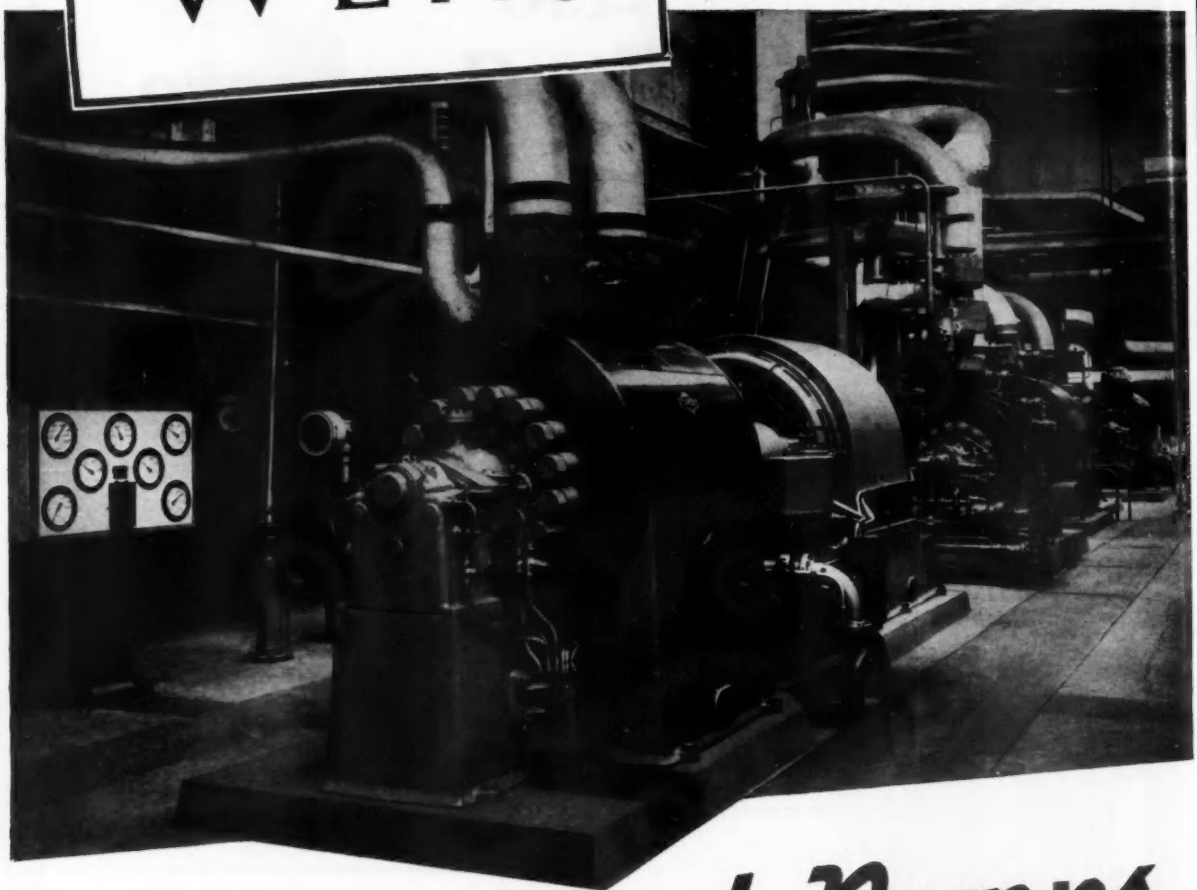

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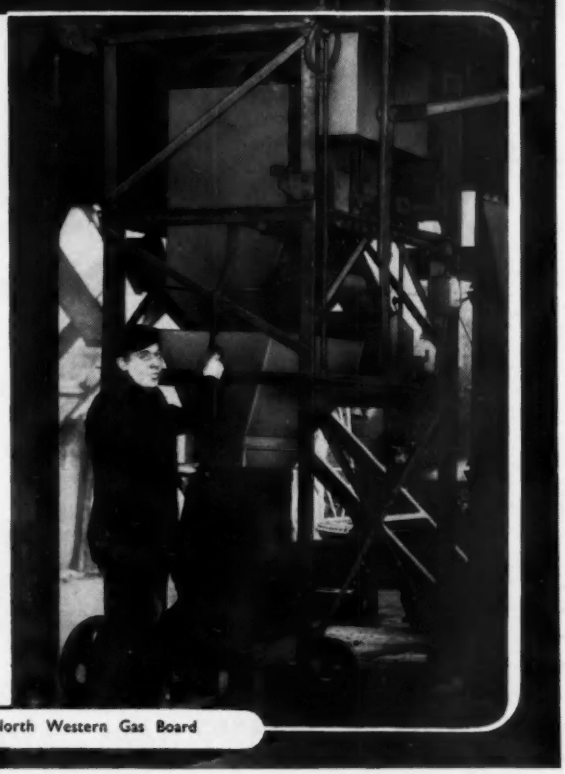

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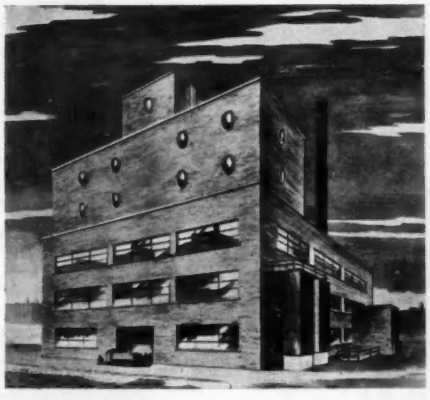

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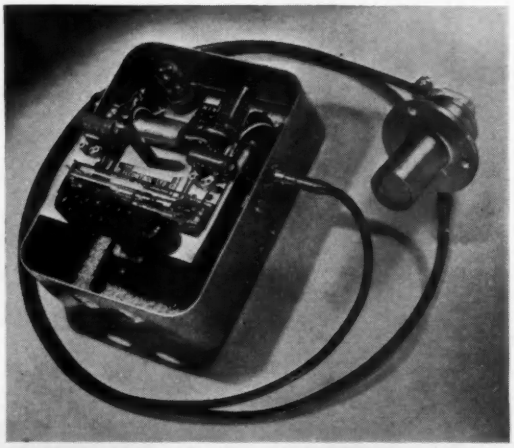

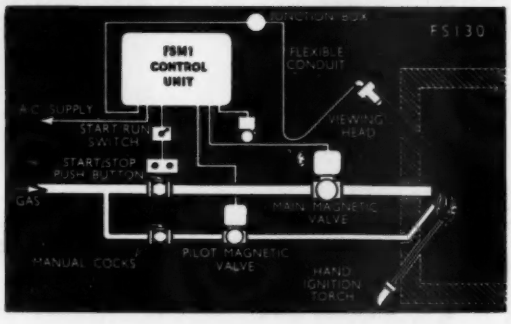

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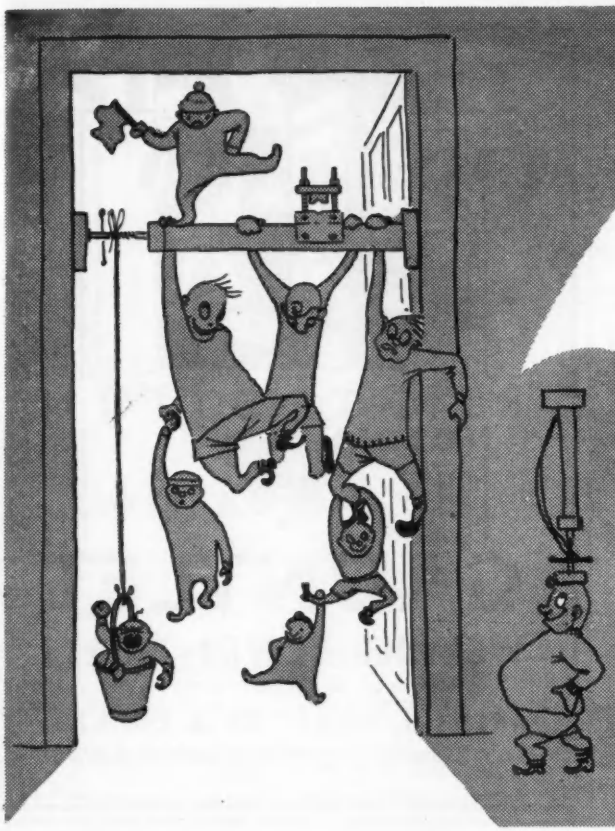

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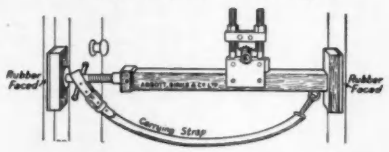

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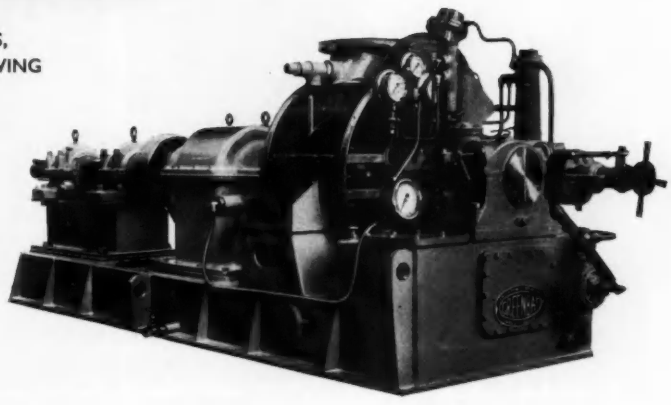

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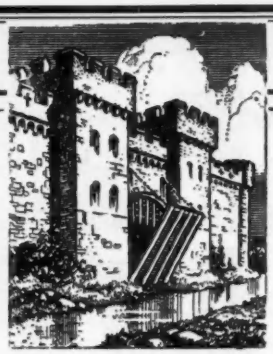

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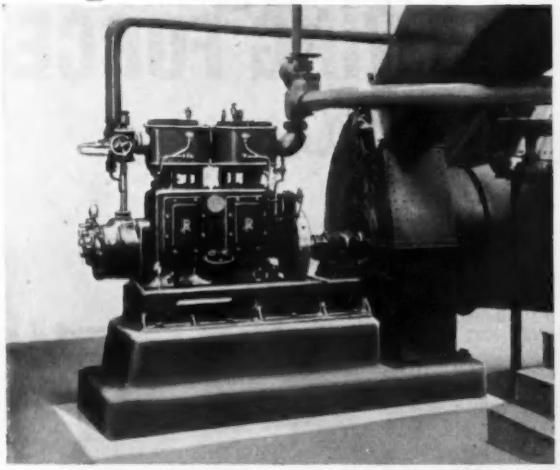

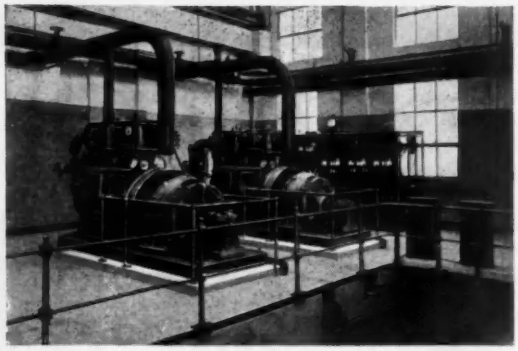

ABOVE : *Parker Engine driving fan on waste heat boiler at a gas works, exhaust steam used for heating feed water.*

RIGHT : *Parker Engines driving electric generators at a gas works.*

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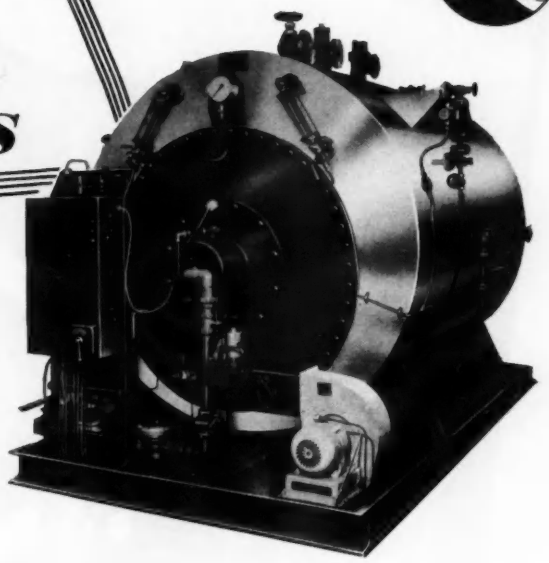

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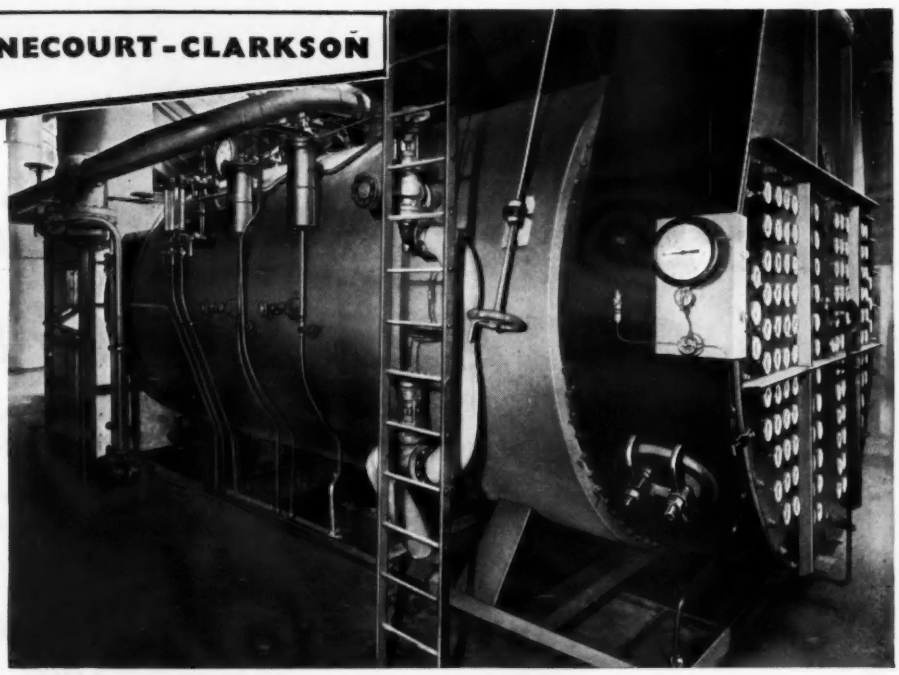

The illustration shows one of the Spencer-Bonecourt waste-heat boilers at Stoke-on-Trent Gas Works. Similar units are installed on all the Glover-West Continuous Vertical carbonising plant in this works.

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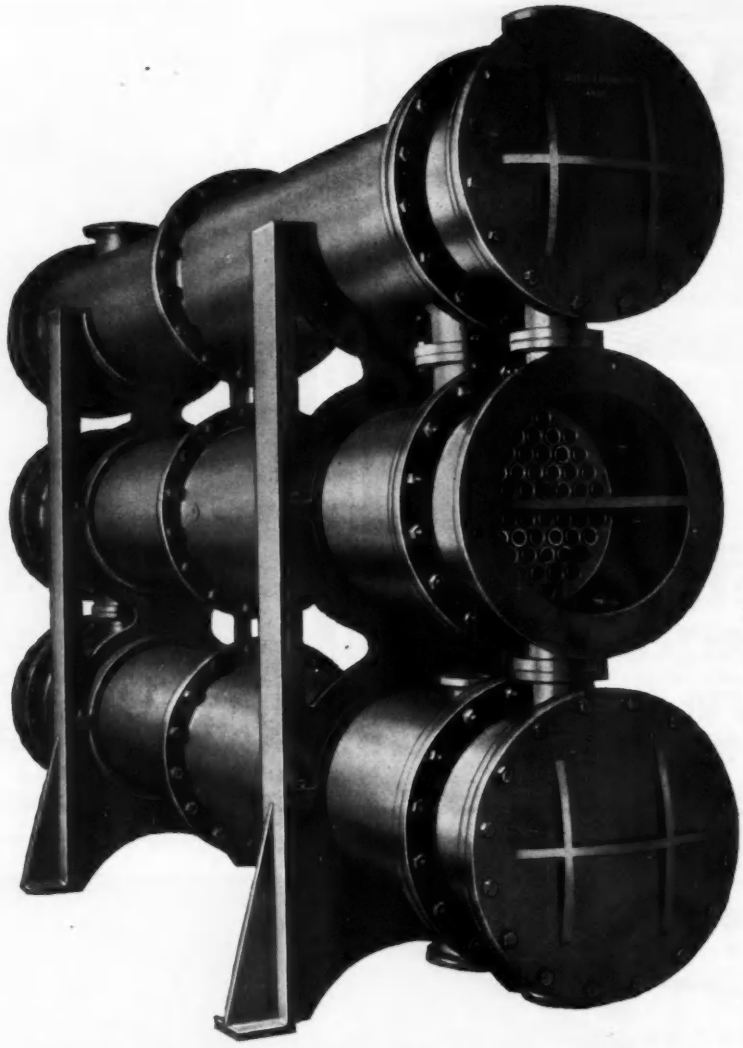

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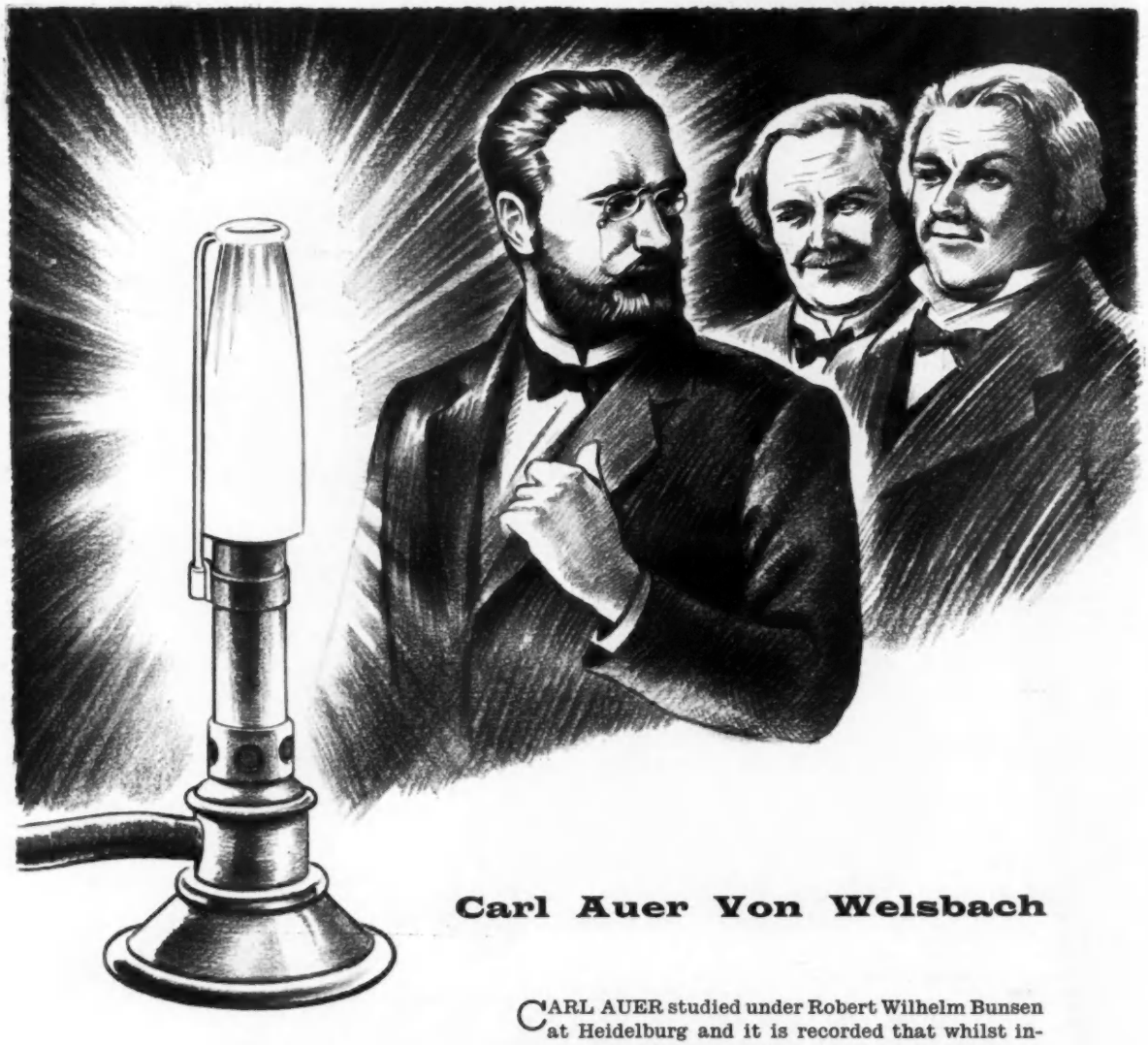

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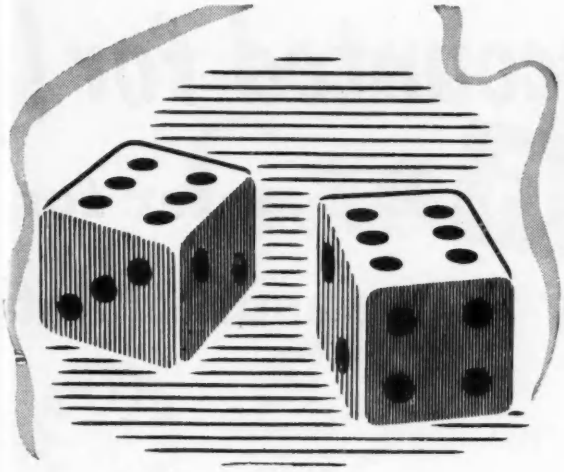

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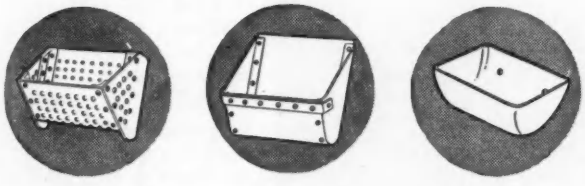

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Gas Journal

VOL. 290 NO. 4893 April 24, 1957

109TH YEAR

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All accounted for!

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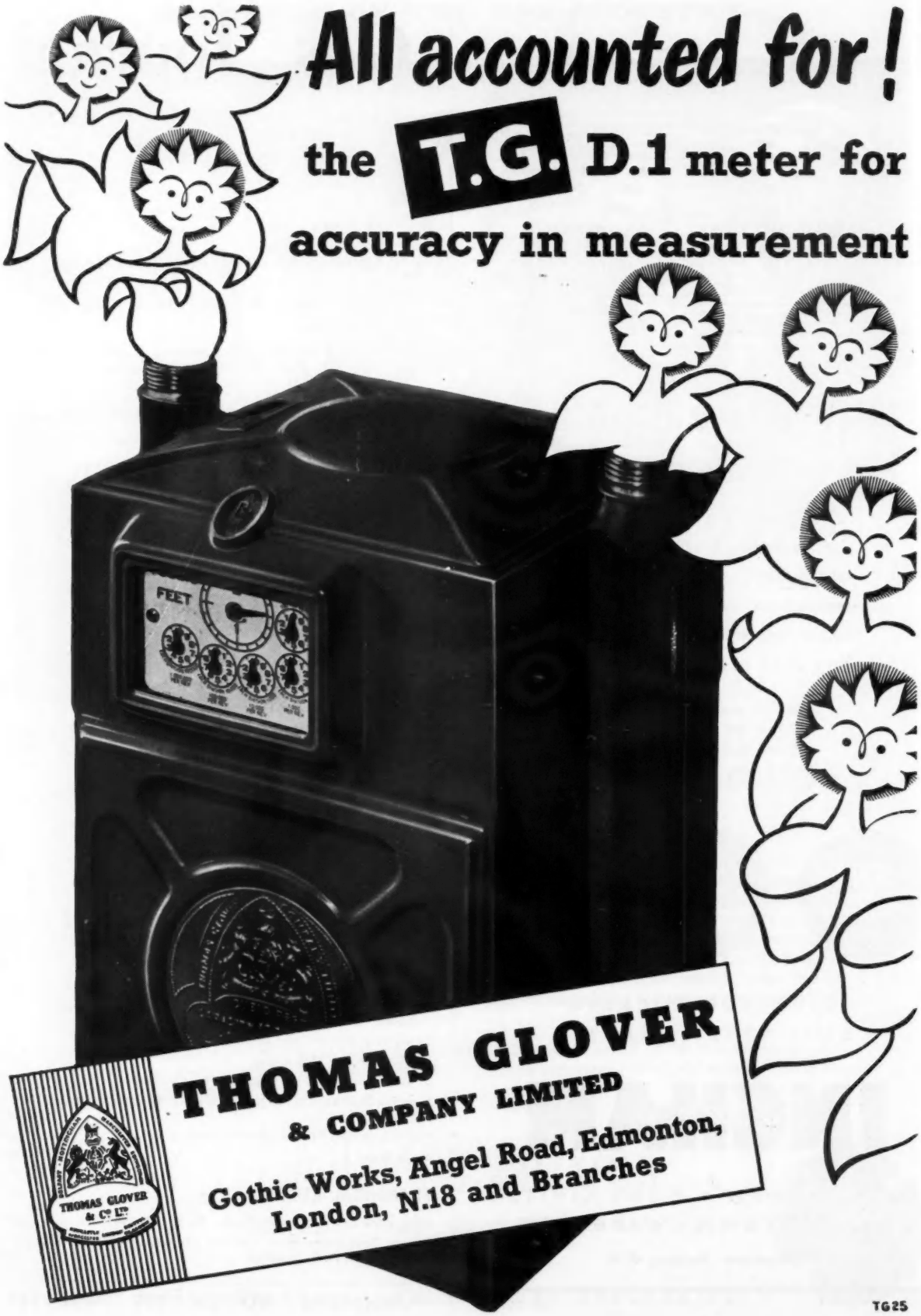

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Gas Journal

VOLUME 290. No. 4893. APRIL 24, 1957. 109th YEAR

First Aid for Discussion Time

EVERYBODY knows that the life blood of a meeting pulses in the discussion, in the give and take of a variety of opinions, and in question and answer. It is primarily because of a weakening of the quality of discussion that technical meetings in the gas industry are becoming increasingly anaemic. That they do in fact lack the vitality and sparkle of earlier days is surely evident to all. The causes of this serious deterioration are several but one reason stands head and shoulders above the rest. It is FEAR—the fear of encouraging the wrath, or even the passing displeasure, of the handful of dignitaries in whose hands rests the major responsibilities of the industry today. We are well aware that a diagnosis of fear will not be popular; those who agree, as surely they must, that there is a lack of grip in discussions today may put forward alternative words—'reluctance,' perhaps. But let us not quibble: We have said fear and we mean it.

The reason for this sorry trend, which is noticeable from the Institution Annual General Meeting down to a group salesmen's circle, is plain enough. Before nationalisation an engineer or a salesman could attend one of the industry's professional meetings and speak his mind. True, he might have hesitated to criticise his own management, but in the vast majority of cases the other undertakings responsible had no jurisdiction over him whatsoever. If he did not agree with their methods or their results, he said so. After all, he had nothing to lose. And to gain? Possibly the reputation for being an outspoken, sensible chap—a reputation which might stand him in good stead at some future date.

With nationalisation all that came to an end. It was inevitable that it should be so because a man who disagreed with the practice followed by another undertaking would in all probability be criticising the policy of his own board. That might result in his becoming known as an interfering character, one who did little to preserve the smoothness of relations in the board. And that in turn might find a black mark against his name when promotion became due. And so on.

That this brand of fear dominates, or at least damages, meetings of all kinds cannot be denied, unofficially. Officially the answer will probably be that we are imagining things. But too many respected men in the industry have muttered private complaints about Big Brother for us to doubt that it exists.

The first point to be noted is what might be termed the regional variation. It is clear that speech is freer in some places than in others. In general those Institution Sections and Junior Associations, a goodly proportion of whose members are drawn from more than one area board, seem less affected, but even in cases where the group is sponsored by one board—such as gas salesmen's circles—there is an astonishing difference in the amount of freedom permitted. Since we cannot believe that the more easy-going boards suffer as a result of this freedom, it is clear that a great deal more relaxation can be safely permitted by the others. Indeed, the result of freer speech would be to give a tremendous fillip to the industry. Thoughts are always clearest when the wind blows free.

It may be that there exists a certain amount of unfounded apprehension. In such cases it is up to the boards concerned to make it very clear that their officers and staff may speak their minds at such meetings as they attend—indeed, that they are encouraged to do so because the boards believe that honest and untrammelled speech is an essential ingredient of successful business and happy staff relations.

But we know for a fact that in other areas uninhibited speech can bring sharp repercussions from above. To them we can only plead for a complete re-appraisal of the situation and a fresh approach. A nagging fear —yes, we must use that word again—that an indiscreet remark may bring retribution in its wake will not only poison the whole complicated network of a board, but will sap originality and undermine morale.

In our view the matter is an urgent one. Somehow the fireworks must be put back into our meetings; one is lucky indeed to find so much as a damp squib nowadays. Most tragic of all is the fact that the younger men come to accept the present situation as being inevitable; their memories cannot go back to the days when good natured give and take, and even an occasional lost temper, were the very wine of gas industry discussions. For a nationalised industry the gas industry is fortunate in many respects; the red tape could have been tied so much tighter. But wherever else the red tape may hamper, trip and irritate, its entangling strands must not be allowed to strangle that last precious freedom—free speech.

Although 'fear of the consequences' is the biggest danger, there are plenty of other reasons for dull and

unsatisfactory discussions. Perversely, we suggest as the first of these supplementary reasons, the author of the paper. How often does it happen that the author, lured into that ghastly snowballing practice of trying to write a longer paper than the last chap, and finally producing a monster weighing several pounds, of which he reads every word, takes up so much time that the discussion never really gets started at all? If authors must produce these gargantuan efforts, containing everything including the kitchen sink (as a folded-in, three-colour line diagram), then of course they must follow standard I.G.E. practice and take the thing as read, presenting only a précis or a guide to significant passages. That at least spares a little time to discuss the matter. But nine times out of ten there is not the slightest reason for papers of such size and something more modest, more condensed, more digestible, and capable of being read from end to end in not more than 45 minutes, would be infinitely more acceptable.

The author, by producing a paper so long that it permits only a crammed few minutes of discussion (of course, this *could* be a shrewd defensive measure designed to nip contradiction in the bud), seemingly has the ghastly effect on his audience of making them want to make contributions to the discussion of equally outsize proportions. Very often, indeed, they can be regarded as nothing other than satellite or subsidiary papers, and except in a very few cases, their effect on a gathering, already suffering from the strain of one and a half hours of concentrated author, is soporific rather than stimulating. How can the situation be improved? We can suggest two ways, both of which demand a fair degree of determination and strong-mindedness. The first is to follow the practice of allowing a maximum of, say, five minutes per speaker, and for the chairman to enforce this rationing scheme with strict impartiality. Of course, we have all seen the people who ignore red light and buzzer alike in their determination to deliver every precious word of their prepared notes. Such tenacity can, it is true, provide a measure of light relief, but in general it is irritating to a degree; the more so when the desperate chairman feels that having prodded the necessary buttons he has now shot his bolt. We have seen when strong words, slow handclaps, and even action by muscled commissionaires would have been legitimate practice! If such a system of rigid time rationing is *enforced* it must in time train speakers to limit their remarks to the allotted period; the average speaker, having once been choked off while in full flood, will be more careful next time.

The other suggestion for improving the situation is a careful elimination of all but a polite pinch of congratulation. Time after time contributions are needlessly swollen by a string of routine compliments. Of course it is right and proper for an author to be thanked for, and often complimented on, his efforts, but that can be done briefly, and without a welter of biographical notes and reminiscences. In any case, the proper place for such courtesies is in the vote of thanks.

It would appear that the art of speaking extempore is fast disappearing; even rough 'headline' notes are giving way to bulky affairs typed in quadruplicate. The method certainly has its advantages, as any technical reporter will admit, but it has one serious disadvantage: Unless the speaker has a lectern or a microphone he is liable to look down at his notes to such an extent that he addresses his remarks to his third waistcoat button. Not only does audibility suffer but the psychological effect is, to say the least, unsatisfactory.

If these methods, or something equally effective, cannot be adopted, it is disturbing to think what the future may hold. After all, if papers have become so long that they are distributed in advance and merely 'introduced,' it is only one step further for contributions to the discussion to be circulated before the meeting and presented briefly by their writers in similar fashion. And from that the natural sequence is towards a meeting held only on paper, with no more life than is contained in a wad of pages in the transactions—a dismal prospect indeed. Can we not therefore brighten up our technical meetings, streamline them, keep the interest alive and the members alert? Exchanges of information of this kind are an essential part of the industry's life They must be preserved at all costs.

Production or Distribution Engineer?

IN his Presidential Address to the Midland Section of the Institution, Mr. F. L. Atkin devotes most of his remarks to the distribution problems of the West Midlands Gas Board and shows how the greater part of the gas in the central area round Birmingham is being distributed to the very large number of industrial customers by a closely integrated grid system. It is this section which we publish on a later page. But at the beginning of his address, he makes some interesting comments on the future availability of highly trained gas distribution and utilisation engineers. In the past, it was only in the larger undertakings that it was possible to indulge in sufficient specialisation to employ both a production engineer and a distribution engineer, and where highly trained specialised personnel were not economically possible, the engineer and manager was both his own production and distribution engineer. With this broad basis to work on he was particularly skilful in both branches, but his sphere of activities in the distribution department was limited both by the locality of his consumers and the limits of his area of supply (not always the same in undertakings operating in remote, sparsely populated areas).

Such distribution systems would certainly have operated at low pressures, and high pressure mains to boost the pressures at the furthest limits of the supply area would have been the exception rather than the rule. The engineer would, therefore, be first and foremost a production man, and his distribution activities, though no less important, would be somewhat secondary. Profits were thought—and rightly so—to be made in the retort house, and only recently has it been said, lost on the district.

When the supply areas were amalgamated into the different area boards and the only boundaries were those between area boards, the scope of the distribution engineer clearly increased enormously, and the integrated grid system became not only almost a commonplace, but an economic necessity.

The formation of the large holding companies in the early 1930's had been the beginning of integrated areas of gas supply, but only in places where the large com-

pany owned or controlled contiguous undertakings or was supplying gas to statutory areas from sources outside the gas industry—for example from coke ovens.

The technical personnel needed for the carrying out of the new integration systems after nationalisation were in a number of cases made available from the big holding companies so that there was a nucleus of trained engineers available, but as time went on and the number of grid systems increased, the importance of the distribution engineer increased also, but his availability decreased. That is the position which obtains today and it is also true of the gas utilisation and industrial gas engineers, because once a good system of supply has been established, then it is possible for the potentially large consumers of gas to be interested in installing gas burning furnaces to take the place of furnaces using other types of fuel.

Who is the more important of the two, the production engineer or the distribution and utilisation engineer? Up till now it seems that the production engineer has been considered the more important, since among the most senior officers of any area board his salary appears to be slightly higher than that of his colleague, the distribution engineer. Mr. Atkin maintains that the keen, ambitious young man entering the industry will strive for the top position and decide to go for the production side, and he reinforces his argument by quoting the number of students entering for the Associate Membership examination of the Institution. Here the number taking the examination on the production side is much greater than that sitting for the supply side—in fact, in some cases there appear to be too few candidates to form a class large enough to justify a course of lectures at a technical college. This is a serious matter, because the demand for, and importance of, the distribution engineer is clearly increasing. It is only necessary to note the tendency in all area boards to confine production to larger and strategically placed production units, to rely on outside sources of gas production, such as coke oven gas or refinery tail gases, and to make use of hitherto unconventional means of gas production, such as oil gasification or hydrogenation, the Lurgi process, or even the importation of natural gas.

All these unconventional sources of gas production will involve very large volumes of gas, which will tend to do away with even some of the larger conventional gas making plants, and may completely modify the layout of divisional areas within a board. This may even cause boards with easy access to suitable port facilities, or suitably cheap fuel supplies for pressure gasification, to export gas to others less well placed. If this should ever come about the importance of the distribution engineer will become paramount and the number of production engineers will decrease to a few, very highly specialised technologists.

Mr. Atkin pleads for more entrants to the distribution side of the industry and for adequate means of training them. He mentions the sandwich courses which have been established in certain centres over the last few years, where the student can get the best of both worlds—six months of full-time study and six months of full-time practical application. Such courses deserve success, but the young man entering the industry still has to choose which branch to enter, and it is up to the industry to advise him wisely.

PROGRAMME FOR THE 94th ANNUAL GENERAL MEETING OF THE I.G.E.

THE 94th annual general meeting of the Institution of Gas Engineers will be held at the Institution of Civil Engineers, Great George Street, London, S.W.1, on May 14, 15, 16 and 17, under the presidency of Sir Henry Jones, M.B.E., Deputy Chairman of the Gas Council. The following is the programme of events:

Tuesday, May 14

10 a.m.: Opening of the meeting; adoption of report and accounts; presentation of medals.
10.25 a.m.: Presidential Address by Sir Henry Jones.
11.10 to 11.15 a.m.: Presentation, without discussion, of 'Aspects of Long-distance Transmission of Gas,' by J. F. Day.
11.15 a.m. to 12.15 p.m.: Presentation and discussion of 'Pressure Gasification of Brown Coal at Morwell, Australia,' by R. S. Andrews.
12.45 for 1 p.m.: President's Luncheon in the Savoy Hotel (by invitation).
3 p.m. to 4 p.m.: Presentation and discussion of 'Coal Supplies for the Gas Industry,' by Charles Johnson.
4 p.m. to 5 p.m.: Presentation and discussion of 'The Development of Catering Appliances,' by E. W. B. Dunning.
3 p.m. to 5.15 p.m.: Ladies' tea party and exhibition of British fine china and earthenware at the Institution's headquarters.
8 p.m. to 1 a.m.: Reception and dance at Grosvenor House, Park Lane, W.2. (Evening or dinner dress, decorations.)

Wednesday, May 15

10 a.m. to 11 a.m.: Presentation and discussion of 'An Approach to the Use of Oil Gas in an Integrated System,' by L. P. Ingram, M.B.E.
11 a.m.: Annual general meeting of contributors to the Benevolent Fund.
11.15 a.m. to 12.15 p.m.: Presentation and discussion of 'Meeting the Gas Load in the North West,' by W. Hodkinson, O.B.E.
Visits: The Watford works and the Ponder's End works of the Eastern Gas Board, Wandsworth works of the South Eastern Gas Board, Aldenham bus overhaul works, Luton works of Electrolux Limited, Fulham laboratories of the London Research Station of the Gas Council, Watson House, Royal Horticultural Society's gardens at Wisley (ladies' visit), and opera performances at Sadler's Wells and Covent Garden.

Thursday, May 16

10 a.m. to 11 a.m.: Presentation and discussion of 'Gas Industry Finance,' by Wilfrid Bailey.
11 a.m. to 12 noon: Presentation and discussion of 'Application of Work Study in the West Midlands Gas Board,' by H. B. Bassett.
12 noon to 12.15 p.m.: Concluding business of meeting.
12.30 for 12.45 p.m.: Council luncheon to the President.
Visits: Watford works and Ponder's End works of the Eastern Gas Board, Wandsworth works of the South Eastern Gas Board, Aldenham bus overhaul works, Luton works of Electrolux Limited, Fulham laboratories of the North Thames Gas Board, Watson House, London Airport (ladies' visit), opera performances at Sadler's Wells and Covent Garden, recital by Yehudi Menuhin and Hephzibah Menuhin in the Royal Festival Hall.

Friday, May 17

Visit: University City of Cambridge.

Personal Notes

MR. LEONARD GEORGE HUMPHRYS, South Eastern Gas Board, has retired. He began his carreer in the gas industry in 1906. After serving an apprenticeship with Sawer & Purves Ltd. of Nottingham he became in 1907, an articled pupil to Mr. (later Sir) Ferguson Bell, Chief Engineer and General Manager of the Derby Gas Light and Coke Company. In 1913, he took charge of the Belper station of the Company, and in the same year won the City and Guilds bronze medal in the Ordinary Grade of Gas Engineering, later obtaining the final certificate. At the outbreak of war, he joined the Public Schools Battalion (21st Royal Fusiliers) and was commissioned in the Sherwood Foresters with whom he served in France. After being severely wounded in July, 1916, he transferred to the Royal Engineers. In 1919 he became Deputy Resident Engineer at the Derby Company's Whitchurch works, and lectured until 1921 at Derby Technical College. He then became Gas Engineer and Manager with the Bexhill Water and Gas Company, serving on under the Bexhill Corporation after their acquisition of the Company in 1926, and later, on nationalisation, as Manager of the undertaking. In 1951, the South Eastern Gas Board appointed him Engineer of the North Sussex District, with production and distribution responsibility for the Haywards Heath, Horsham, Hassocks, Burgess Hill and Uckfield undertakings. The last of these units, Haywards Heath, closed for manufacture under the integration scheme in February of this year. He is a member of the London and Southern Section, Institution of Gas Engineers, and was on the Committee of the old Southern Association of Gas Engineers for whose Eastern Section he contributed two papers. His retirement ends a long family connection with the industry; his grandfather, Mr. W. C. Humphrys, left the Winchester Water and Gas Company to be Secretary of the Barnet Gas and Water Company in 1862; his uncle, Mr. H. Humphrys, was Engineer of the Salisbury Company, while his father, Mr. F. C. Humphrys, was in charge of the Ilkeston undertaking for many years.

MR. REGINALD CATHERALL has been appointed a director of Solartron Research & Development Ltd., Goodwyn's Place, Dorking, Surrey. On March 26, he departed for the United States on a two months' visit to the Consolidated Electrodynamic Corporation, Pasadena, California, with whom the Solartron Electronic Group, Ltd., maintain a friendly technical association and for whom the Group acts as sole selling agents in the United Kingdom. He will study the American techniques in data processing, which is a field in which the Solartron Group is now making substantial leading developments.

MR. J. O. HITCHCOCK, a Director of the Mond Nickel Co., Ltd., has been elected a Director of Henry Wiggin & Co., Ltd.

MR. F. E. MILLS, Officer-in-Charge of the General Laboratory at Watson House, has retired from the service of the North Thames Gas Board after 39 years with them. An acknowledged authority on gas quality and testing, Mr. Mills is well-known for his contribution to the book on 'Gas Calorimetry' in association with Major Hyde. He has also presented many papers to the technical bodies, and for his paper on 'Carbon Monoxide' was awarded the I.G.E. Bronze Medal. At Watson House the other day, a series of presentations was made to Mr. Mills to mark his retirement. Following Mr. Mills' retirement, North Thames Gas Board announce that MR. J. A. PRIGG has been appointed as Officer-in-Charge, General Laboratory, Watson House. North Thames Gas Board also announce the following appointments: MR. M. GREGORY as Senior Assistant Engineer, Bromley works, MR. J. A. REECE as an Assistant to the Chief Accountant, and MR. N. L. HENSON as Commercial Assistant to the Divisional Manager, North Western Division.

Diary

April 25.—INSTITUTE OF FUEL: Annual Luncheon, Connaught Rooms, Great Queen Street, Kingsway, London, W.C. Reception at 12.30 p.m. for luncheon at 1 p.m.

April 25.—NORTH OF ENGLAND SECTION, I.G.E.: Three Tuns Hotel, Durham. Joint Meeting with the Coke Oven Managers' Association, Northern Section. 'Co-ordinated Production in a Grid Area,' G. E. Anderson. 7 p.m.

April 25.—WALES AND MONMOUTHSHIRE JUNIORS: South Wales Area: Newtown, Montgomeryshire. A.G.M.

April 26.—MANCHESTER AND DISTRICT SECTION, I.G.E.: The Engineers' Club, Albert Square, Manchester. Seventh A.G.M. 2.30 p.m.

April 26.—SCOTTISH WESTERN JUNIORS: Gas Showrooms, 522, Sauchiehall Street, Glasgow, C.2. A.G.M. 6 p.m.

April 27. — LONDON AND SOUTHERN JUNIORS: Visit to Aldershot Distribution System.

April 30. — MIDLAND JUNIORS: Staff Mess Room, W.M.G.B., Birmingham. A.G.M. Address on "The Art of Public Speaking.'

'A Question of Fact'

The Gas Council Dramatic Society is presenting 'A Question of Fact,' by Wynyard Browne, on Tuesday, May 7, at the Rudolf Steiner Theatre, 33, Park Road, London, N.W.1, commencing at 7.30 p.m.

Seats are obtainable from Miss J. Bolton, 1, Grosvenor Place, S.W.1, at 7s. 6d., 5s., 3s. 6d. and 2s. 6d.

MR. J. F. SHUTTLE has been appointed General Sales Manager to W. E. Bray & Co., Ltd., Feltham. Before this appointment Mr. Shuttle had, since 1953, been Export Sales Manager to the same Company.

Correspondence

LINCOLN UNDERTAKING

DEAR SIR,

While we appreciate the fact that you have considered our paper worthy of editorial comment we feel that the remarks made about the Board's predecessors are unjustly harsh.

It was realised that on the facts as presented it was possible to interpret an implication of lack of foresight in the past and since in the opinion of the writers this was not so, we endeavoured to make this point clear in our introductory remarks at Boston.*

It is not disputed that the distribution system as we found it shortly after vesting date suffered from serious limitations but, with an undertaking having a large percentage of industrial sales, long range forecasting of outputs is subject to considerable chance. It should further be borne in mind that the old distribution system was planned in the early 1930's at a time of industrial depression when forecasting of industrial loads would have been more than unusually hazardous.

Yours faithfully,

D. W. AULT.
J. W. WILSON.

Lincolnshire Division Headquarters,
East Midlands Gas Board.

April 12, 1957.

* In their introductory remarks to the paper, the authors said:

' . . . It may appear from the paper that in view of the extensions which we have shown to be necessary, there is an implication that the Board's predecessors were guilty of lack of foresight.

'This is certainly not the case and I think we should take this opportunity of paying tribute to the planning carried out by the late Mr. George Wright when he reconstructed the works in 1932 which reconstruction was described to you in his presidential address on May 6 and 7, 1936.'

EVENING STAR LODGE

A meeting of the Evening Star Lodge will be held on Monday, May 13; and the Master and Brethren hope that many masons among those in London for the Institution meeting will wish to attend Lodge at Freemasons' Hall and dine afterwards at the Connaught Rooms. Applications for tickets should be made to the Secretary, Mr. W. S. Gooch, at 1, Rugby Road, Twickenham. The dining fee will be 35s., including wines.

Scottish Managers' Association's Most Important Events Dovetailed

SPRING MEETING TO GO; AUTUMN SESSION CUT DOWN

Board Will Hold Annual Conference

IN future there will be no spring meeting of the Scottish Association of Gas Managers—and the autumn meeting will be cut to two days. This follows the decision of the Scottish Gas Board to inaugurate an annual staff conference.

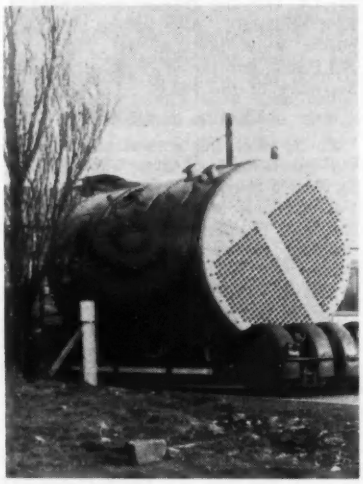
In order to accommodate this conference, and to avoid adding to the number of meetings, it has been decided to hold no spring meeting of the Association this year or in future years.

Rule Amendments

The Scottish Gas Board's first staff conference is to be held in Perth on May 23 and 24. Efforts are being made to arrange a general meeting of the ordinary members of the Scottish Association on May 25 so that there may be submitted for adoption the various amendments to the constitution and rules following the elimination of the spring meetings.

Dates for A.G.M.

The two-day annual general meeting will be held this year at St. Andrews—on September 19 and 20.



Road negotiation was difficult but the picture shows the giant boiler arriving safely at the works entrance.

BOILER MAY SAVE FIRM 60 TONS OF COAL WEEKLY

A NEW waste heat boiler, which, it is calculated, will result in a weekly saving of 60 tons of coal is being installed by Sheet Glass Limited, a subsidiary of Pilkington Brothers Limited, the glass manufacturers, at their works in Queenborough, Kent.

This Spencer - Bonecourt - Clarkson boiler has been designed to operate on the waste gases leaving a producer gas-fired furnace. Previously these have passed straight to the chimney stack as smoke. The gases leaving the furnace pass through regenerators for pre-heating the incoming producer gas and combustion air at a temperature of 500°C., by means of a 50 H.P. electrically-driven draught fan at the boiler outlet.

Measuring 19 ft. by 12 ft. and weighing 32¼ tons, the boiler has a total heating surface of 7,250 sq. ft. and is designed for a working pressure of 120 lb. per sq. in. with 100°F. of superheat.

Makers of the boiler were Edwin Danks & Co., Ltd., of Oldbury, Birmingham, a sister company of Spencer-Bonecourt-Clarkson Limited.

New Name For Smoke Society

THE National Smoke Abatement Society is to seek incorporation as a company limited by guarantee and without share capital, and with the new name 'National Society for Clean Air.'

Sir Thomas Williamson, Chairman of the T.U.C., having a discussion with Dr. A. B. Badger and Sir Harold Smith during the visit.

UNION CHIEFS VISIT PONDERS END WORKS

REPRESENTATIVES of the nationalised industries and economic committees of the Trades Union Congress visited the Ponders End works of the Eastern Gas Board recently at the invitation of the Gas Council. Their party was led by the Chairman of the T.U.C., Sir Thomas Williamson, and included the Chairman of the economic committee, Mr. W. L. Heywood, and the Chairman of the nationalised industries committee, Mr. H. Hewitt.

The party was welcomed at Ponders End by the Chairman of the Gas Council, Sir Harold Smith, and the Chairman of the Eastern Gas Board, Sir John Stephenson. Others present were: Mr. F. G. Brewer, Secretary of the Gas Council, Dr. A. B. Badger, Industrial Relations Officer of the Council, and Mr. K. E. Abbs, Secretary of the Gas Council's Industrial Relations Committee.

Newton Chambers Put Engineering Development Under One Roof

NEWTON CHAMBERS & CO., LTD., of Thorncliffe, near Sheffield, have decided to centralise all their engineering development activities and rehouse them in their new Development Department. They have also completed an extension to their heavy constructional shop—the output of which has doubled since 1947. The extension will enable the shop to increase output by a further 50%.

Pioneers

Newton Chambers were pioneers in the distillation of coal-tar oils which led to the company's present extensive chemical business. They were in at the beginning of the gas industry, equipping gasworks throughout the country. They have developed modern domestic and industrial heating appliances, and currently they are playing an important part in equipping Britain's expanding steel industry.

Prototypes

The new Development Department building is of portal frame construction with blue vitrolite slab curtain walling between the windows in the exterior walls. These slabs are in air-spaced double panels for insulating purposes.

The chief feature of the building is the main central workshop in which will be produced and tested prototypes of the various kinds of plant intended for

(Continued on p. 195)

Annual General Meeting at Birmingham

GAS BOARDS HAD 'EXCEPTIONALLY TRYING TIME DURING LAST FINANCIAL YEAR,' SAYS MIDLAND SECTION OFFICER

REFERENCES to difficulties which have beset the gas industry in recent times were made by Mr. F. L. Atkin, Senior Vice-Chairman of the Midland Section, when he proposed the toast of the East and West Midlands Gas Boards at a luncheon preceding the annual general meeting of the Section in Birmingham on April 12.

All gas boards had an exceptionally trying time during the last financial year, he said, but it was too early to discuss the results. There had been industrial unrest, the credit squeeze, the increase in interest rates, the pledge to peg prices, wage and fuel increases, oil shortages, and just for good measure, one of the mildest winters on record—in fact 'the lot'!

In the Midlands they were particularly sensitive to these difficulties in view of the importance of the two Boards to the national economy and industry. Not only were they among the largest of the area boards but, unlike the others, more than half the gas sold was used for industrial purposes in factories, not only making a substantial contribution to clean air but also improving productivity and working conditions.

It was unlikely, said Mr. Atkin, that atomic energy would affect the situation for many years to come—in fact some of the largest users of gas were the electrical manufacturing industries.

Mr. Atkin referred to the way in which the East and West Midland Gas Boards had combined to give members of the Midland Section every facility and encouragement to attend and take part in meetings. He added that they appreciated the presence of the two Chairmen at their meetings. Mr. Atkin said the fact that the majority of the Section were drawn from two Boards meant that interchange of technical experience was on a much broader basis.

Welcome to Visitors

Responding, Mr. G. le B. Diamond, C.B.E., Chairman, West Midlands Board, expressed his pleasure at the presence, among his colleagues, not only of those who had supported him since nationalisation but some others from the Ministry who had carried him on their backs during the war years. (Mr. Diamond was referring to the presence of Mr. A. N. Dodson and Mr. D. E. D. Kennedy, Regional Directors of the Ministry of Power.)

Seeing Sir Henry Jones, Deputy Chairman of the Gas Council and President of the Institution, at the luncheon reminded him that Sir Henry was also Chairman of the Gas Council Coke Committee. It reminded him too that his Board was up to its ears in coke. He had reached that cynical age when he had begun to doubt the wisdom of the Ministry and its advisers who had suggested that in order to meet the needs of the Clean Air Bill they must get coke out and oil in. Now they had 180,000 tons of it piled high on all the available stacking grounds and he had estimated that if it could be stacked in New Street it would make a pile 150 ft. high from Victoria Square to the Times Furnishing Company! This was the result of the Ministry and its advisers—coupled of course with a mild winter!

Of Mr. Atkin, who would become Chairman of the Section, Mr. Diamond said that he was an esteemed officer of the Board and that they had all been delighted at his appointment as Chairman of the Pipes Committee of the Institution—a position of great importance. He was also delighted to have present Mr. R. S. Johnson, Chairman of the East Midlands Board who was a charming and valued colleague; he could not have any wish for a finer successor to Mr. Sydney Smith. Their friendship extended down through the officers and the two Boards were really working as one.

'A New Era'

Proposing the toast of the Institution of Gas Engineers, Midland Section, Sir Henry Jones referred to Mr. Diamond's 'leg-pulling'—'he likes to show me up!' In a brief survey of the gas industry's present position Sir Henry said that it might well be on the verge of a new era in which technical processes not yet developed would play a large part. In addition to oil gasification there were also the possibilities of coal gasification and of the importation of liquid methane, quite apart from the search for natural gas which still continued and which might one day result in an indigenous supply of natural gas.

If any of these new processes were adopted on a large scale, gas would be transmitted over longer distances and at higher pressures than had hitherto been necessary in this country.

The Midlands was a virile and prosperous part of the country with many national advantages. There were large centres of population, the people of which possessed enormous and highly developed skills. As the heart of industrial Britain the industries of the Midlands were responsible for a large proportion of the experience without which we cannot survive as a trading nation. With this background it was not surprising that the Section and the Association before it had been presided over by many distinguished individuals well-known in the gas industry since Charles Hunt was first President in 1878. Later that day the Chairman of the Section, Mr. John Corrigan, whose stirring record of work in the industry was known to them all, would hand over the Chairmanship of the Section to Mr. Atkin, and he could think of no more worthy recipient. Mr. Corrigan responded.

Representatives of the West Midlands Gas Board at the luncheon included Sir Arthur Smout, Alderman G. E. Hodgkinson, and Alderman J. H. Lewis, Members; Mr. W. R. Branson, Deputy Chairman; and Mr. J. C. Ingram, Secretary. Mr. E. Harman, Deputy Chairman, and Mr. A. Gwynne Davies represented the East Midlands. Also among the special guests were Mr. A. H. Pinder, of N.I.F.E.S., and Dr. W. T. K. Braunholtz, Secretary of the I.G.E.

Election of Officers

Later, when the annual general meeting was held, Mr. Atkin was elected to serve as a district member of the Institution Council in 1957-58, and Mr. J. Corrigan (Leicester) was elected as an ordinary member of the Institution Council for 1957-60.

Mr. E. T. Pickering presented the report of the Midland District Education Committee and Mr. F. W. Kendall (Worcester) gave what was described as his usual 'pep talk,' urging members to contribute to the Institution's Benevolent Fund. The Midland Section had lost its place as principal contributors, he said, and this was largely because the value of the fund was not being brought to the attention of the junior members. A cheque for £54 10s. was then handed over to Sir Henry Jones who thanked the Section for its generous gift.

Mr. Atkin was then inducted as Chairman and Mr. Corrigan, handing over to him his chain of office, spoke of him as being a well respected man in the West Midlands area. It had been inevitable that he would reach the position of Chairman of the Section.

As his first duty as Chairman, Mr. Atkin presented Mr. Corrigan with a cheque to purchase a travelling case.

Mr. Atkin then presented his Chairman's Address (published on p. 179).

Proposing the vote of thanks to the Chairman, Mr. F. H. Bate, Senior Vice-Chairman, said that in this single document the Chairman had discussed all aspects of distribution in a logical and orderly sequence. He had started by stressing the value and functions of distributing engineers and had described their education and training. From this he had moved on to the planning of the integration schemes in the West Midlands and had given great detail about the central group stretching from Coventry in the East, through Birmingham to Wolverhampton in the West. Although this would be of primary interest to distribution engineers it would also be of great value to station engineers who were now interchanging gas from station to station.

The vote of thanks was seconded by Mr. J. S. Fox Andrews (Derby).

From the Chairman's Address to the Midland Section, I.G.E., at Birmingham, on April 12

Integration in the West Midlands

—and the Distribution Problems involved

By F. L. ATKIN, M.I.Mech.E., M.Inst.Gas E.,
CHIEF DISTRIBUTING ENGINEER,
WEST MIDLANDS GAS BOARD

In the West Midlands Gas Board there is practically no surplus coke oven gas, refinery gas, or indeed surplus gas of any kind, which has benefited other area boards. Consequently it has not been possible to promote any spectacular schemes, but in spite of this there has been steady and substantial progress; 32 schemes have been completed, comprising 144 miles of main, much of it 18 in. and 24 in. dia. at a cost of £1,894,816. In addition there are four projects under construction comprising 32 miles of main at an estimated cost of £291,329. A further 11 schemes, totalling 94 miles of main, at an estimated cost of £1,377,000, are under consideration.

The first steps were to make an assessment of the plant availability, the present and future gas consumption, the phasing of bringing into operation of additional plant already in hand, and the selection of future base load units and determining those to be closed down. Time will not permit of describing all the deliberations which took place, but it soon became evident that the demand had outstripped the manufacturing capacity and that even the capacity of the new plant already on order would be taken up as soon as it became available. Therefore additional plant would be required.

The overall plan was to link up the larger manufacturing units which would become base load and close down the uneconomical units as and when they ran down, but since it appeared that five years would elapse before surplus gas production capacity was available and after that time a new large size production unit would be necessary, the intermediate plan was to improve the trunk main distribution system by laying such mains as would eventually form part of a grid system and could also readily absorb and distribute gas from a new unit wherever placed.

The area falls naturally into a number of regions comprising groups of undertakings possessing similar characteristics of gas utilisation and methods of living centred around one or more large undertakings. They may be regarded for this purpose as follows:—The central area (including Birmingham, the Black Country, and Coventry); Stoke and the Potteries; Worcester and Malvern; and Wellington.

The Central Area

Of the total gas made by the Board 71% is distributed in the central area, which includes the City of Birmingham and surrounding districts, together with the conurbation of the Black Country and Coventry. This area is predominantly industrial and contained within an area of approximately 1,100 sq. miles and was supplied by 33 gasworks, apart from the Mond gasworks.

As mentioned before, the demands for gas exceeded the plant availability and therefore the closing down of any production units was out of the question for the immediate future—in fact, immediately after vesting date a deputation of industrial users approached the Board and in no uncertain terms demanded an immediate increase in industrial supplies. It was therefore, first, a matter of 'make do and mend' by improving output of existing production units and, secondly, considering the possibility of installing additional plant in the shortest possible time. In the meantime, a number of industrial loads were accepted on an interruptable basis.

It became apparent that, taking into account the extensions already planned, all the available space on existing works had been taken up and therefore attention was directed to the provision of a new works. The siting of this became an extremely difficult problem. Practically the whole area is built-up, and the choice is narrowed still more when conditioned by the various requirements of access by rail and road, disposal of effluent, and the amenities of the district; in addition, much of the area is honeycombed with old mine workings. Even up to the preesnt time it has not been found possible to acquire a site.

There were also a number of severe distribution problems in districts where the loads accepted during wartime had outstripped the capacity of the existing mains—notably Darlaston, West Bromwich, Oldbury, and the northern part of Walsall. The combination of the above factors was such that in spite of everything which could be done it was necessary to refuse many large industrial loads.

It will be appreciated that the forward planning of integration was extremely difficult as at that time it was not known precisely where the additional gas would come from, apart from the projects already in hand, but nevertheless it was realised that the discreet laying of mains could allow small surpluses to be shunted about and also enabled retort house repairs to be interlocked.

As the total daily amount of gas distributed on a maximum day was 233 mill. cu.ft., it will be realised that any integration scheme must be substantial in additional to being flexible. It was obvious that one had to think in terms of 24 in. dia. pipes and the laying of these could not be treated in a haphazard manner, not only because of their cost but because of the physical difficulty of accommodating such large size mains in the congested roads of this built-up area and, further, the situation was bedevilled by the shortage of large diameter cast iron pipes, and particularly special castings.

Birmingham Supply

There were, however, one or two factors which could be taken into account for the future. The Birmingham area was supplied from the Swan Village gasworks which were situated in the West Bromwich area of supply to which no gas was given to the immediate area, but trunk mains passed through West Bromwich to supply Birmingham to the south-east, and Darlaston, Wednesbury, and part of Walsall to the north and north-west. The connecting main between Swan Village and the main Birmingham works holder station at Washwood Heath—a distance of nearly 12 miles—was laid through the main thoroughfare of West Bromwich, part 30 in. and 24 in. with open joints and duplicated in parts with 24 in. mechanical joints.

Shortly after vesting date the planned extensions at Walsall were approved and it was decided to build two 6 mill. cu.ft. holders at James Bridge. Negotiations were also proceeding with a possible site for a gasworks not very far away from James Bridge, and it therefore seemed that a principal spine main between James Bridge and Washwood Heath via Swan Village would form the nucleus of a grid system, using the above-mentioned main as an intermediate measure. It was also necessary to reinforce the Darlaston area because of poor pressures due to the heavy industrial demands, and although it would be five or six years before the Walsall gas became available, a main was laid primarily with that object but eventually to form part of the spine main. About that time it was necessary to reinforce the north-eastern part of the Bilston area, the southern part along the main Wolverhampton Road and the Dudley Road area of Wolverhampton, which is

between Bilston and Wolverhampton manufacturing stations. These mains formed a nucleus of the Wolverhampton northern integration scheme with Wolverhampton at the north, Dudley at the south, and Bilston between. From Dudley a southern integration scheme extended to include the smaller undertakings of Cradley Heath, Halesowen, and so on; Stourbridge was at the southern extremity of this system.

It would take too long to go through the various factors which were taken into account in the development of the grid which is now almost complete and as illustrated in Fig. 1. Quite recently additional manufacturing capacity of 6 mill. cu.ft. per day was put to work at the New Walsall works, which is the first time a substantial amount of surplus gas has become available for general distribution to the grid, and it is very gratifying to be able to report that it (the grid) is fulfilling its purpose in an excellent manner. There are one or two unique characteristics of this grid which merit attention: The daily capacity of the manufacturing units is given on the diagram and for the year 1955/56 the annual output from the connected stations was over 53,000 mill. cu.ft., which is greater than the total individual outputs of seven of the 12 area boards; and when it is realised that this gas serves an area of about 1,100 sq. miles (approximately equal to the area of the North Thames Gas Board) some idea of the problem can be envisaged, added to which was the fact that all the manufacturing stations had been erected to supply local demand with no thought of ultimate integration. As planned, the undertakings were only concerned with supplying their own pre-vesting statutory area, which in many cases was by no means inconsiderable and this had to be continued whatever else integration might do. Many areas were contiguous and therefore copybook integration in the shape of isolated bulk supply mains between undertakings was not only economically impractical, but due to the large size of mains required and the congested areas through which they would have to be laid was almost a physical impossibility. It is for this reason that a number of large size governors (usually accommodated in brick-built governor houses) have been installed to reinforce the built-up areas, especially on the outskirts of the existing undertakings where development frequently takes place. This facility of the grid system has in itself saved considerable sums of money as otherwise it would have been necessary for undertakings to reinforce their outskirts with either larger size medium pressure or high pressure mains.

In many respects the grid can be considered as an amalgamation of a number of satellite systems such as the Birmingham system, the Warwickshire system of Coventry and Nuneaton, and Coventry and Leamington, the Walsall, Lichfield and Cannock system, and the northern and southern section of the Wolverhampton Division. The annual charges on the mains laid, under construction, and under consideration, represent just over one tenth of a penny per therm on all gas sold in the area.

Now that extra gas for the grid is becoming available, the Board are about to introduce a central system so that directions can be given on the manufacture and distribution of gas. The grid will, with one or two minor exceptions, be capable of accepting and disposing of the gas as planned by central control by direct communication between the major manufacturing stations, but due to the peculiarities of the system I have already mentioned, especially in respect to the number of district governors installed, it will be necessary for some time for the local dispositions to be made at divisional or district level. To take a simple example, the amount of gas which

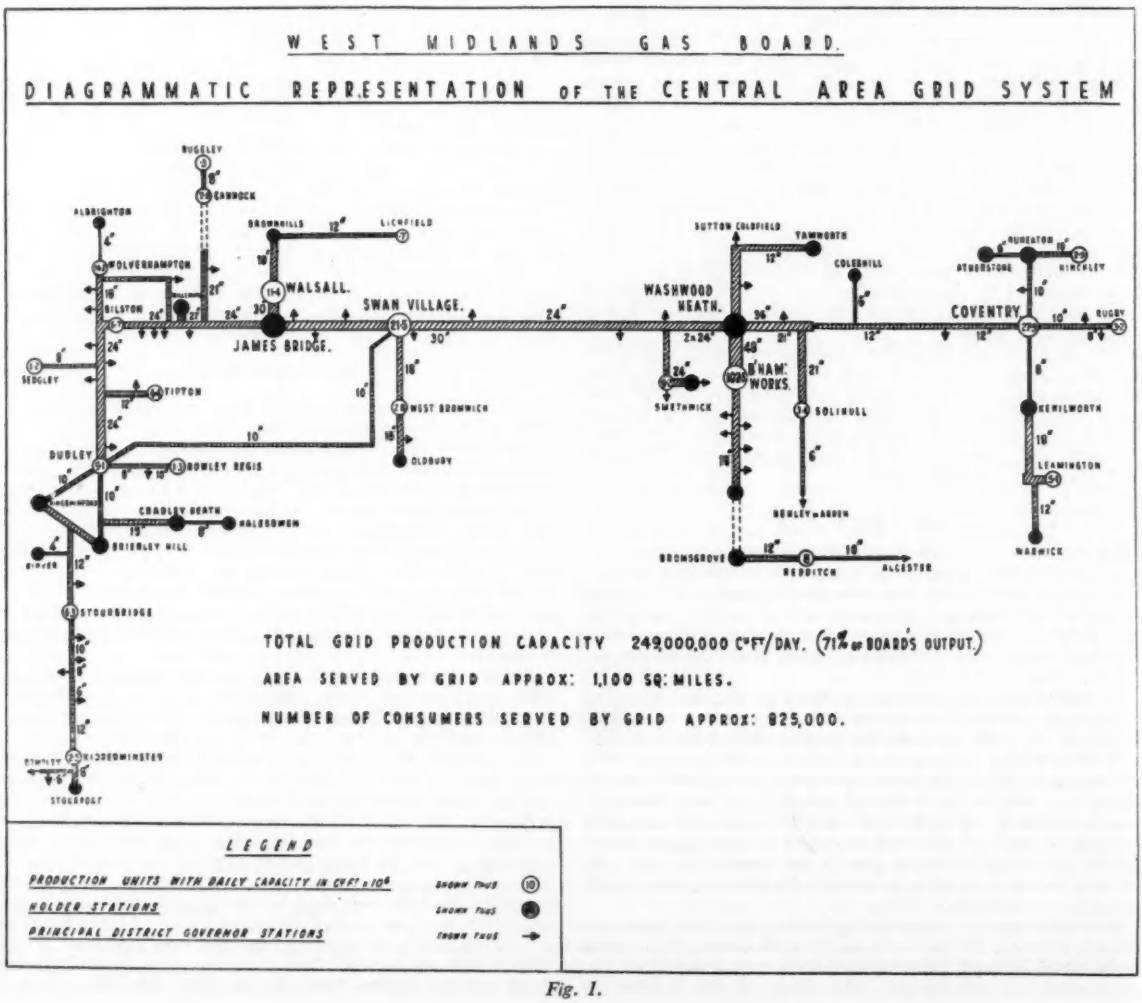


Fig. 1.

can be accumulated at Wolverhampton when being supplied from Bilston is influenced by the setting of the district governors on the feeder main between Bilston and Wolverhampton, the settings depending on the day and the season and various other factors known only to the division or district. In due course it may be possible to operate these automatically from a remote point, but indications so far are that the simple direct methods are the best and safest as there is so much less to go wrong. Another example is the area of Darlaston and Wednesbury using approximately an average of 24 mill. cu.ft. per week 4/5 mill. cu.ft. per day) which was normally supplied from Swan Village. The medium pressure main of 24 in. dia. laid between James Bridge and Swan Village can supply this area by means of three district governors. If Swan Village is to be relieved of 4/5 mill. cu.ft. per day, the compressors at James Bridge are started up and gas fed into the main which takes over the district and automatically backs out the pressure controlled boosters running at a lower pressure at Swan Village, and takes over the balance of the output from these boosters, which are also supplying West Bromwich, Oldbury, and Birmingham. Should the James Bridge compressors stop either accidentally or intentionally the Swan Village booster would automatically pick up the load. A similar arrangement is in operation between James Bridge and Bilston.

The other regions do not represent problems of the same magnitude and both the Worcester and Malvern region and the Wellington region follow traditional integration systems in respect of laying mains from a parent undertaking and closing down the smaller units, using the holders when in reasonable condition. A special problem existed between Worcester and Malvern. Worcester was short of holder capacity and had to shut plant down at weekends, and the impact of the Monday morning industrial load made matters worse, but on the other hand Malvern had good holder capacity so that an early operation was to lay a main between Worcester and Malvern by which means the difficulties were ironed out. Last year, Upton, Colwall, and Ledbury, were closed down and supplied from Malvern. Bromsgrove was closed in 1954 and supplied from Redditch.

The first undertaking to be closed by the Board was Bewdley in 1951 which is now supplied from Kidderminster. The first section of the main was made sufficiently large enough to continue to Stourport. This main has now been laid and Stourport is on the point of being closed down when further supplies become available from Stourbridge.

Shropshire Division

The principal problem in the Shropshire area was a number of small undertakings surrounding Wellington which had a rapidly developing industrial load. Some of these undertakings were in a very bad way but were receiving a partial supply from Wellington. The plan was to afford a complete bulk supply to Shifnal, Ironbridge, Newport, Wem, and Bridgnorth. So far Shifnal has been closed down and while connections have been completed to Ironbridge and Newport, they cannot be closed down until more gas is available from Wellington; for that reason it may be necessary to continue with Bridgnorth in operation.

Vesting date found the potteries at the height of the export demand and it will be recalled that this was so great that certain types of decorated china were prohibited from sale in this country. New kilns were being constructed and the advantages of gas were such as to create a demand for supplies which at that time could not be met. Further plant was to come into operation in a year or two but in the meantime the situation was eased by connecting up Stoke with Newcastle, where there was a small surplus, and also by making an interconnection with Leek and installing compressors there which enabled Leek to operate as a base-load station sending its surplus into Stoke. In addition, the supplies of coke oven gas were stepped up slightly. Eventually the new plant of 8 mill. cu.ft. per day came into operation in 1955, and now there are sufficient supplies for present needs. The latest development will be the laying of some steel mains to take methane gas from mines drainage from the Wolstanton and Holditch Collieries.

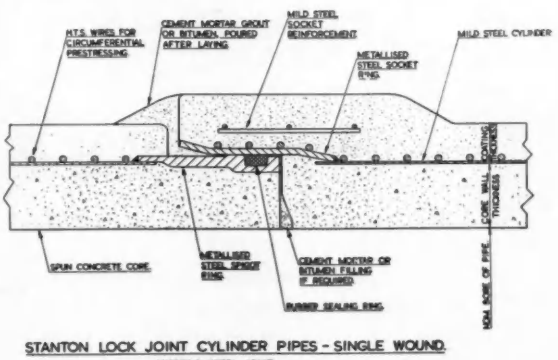
It was necessary to lay part of the integration main between the Walsall Division and the Wolverhampton Division along the towing-path of a canal for some 2,300 yards because the alternative and most direct route passed through the heavily built-up area of Willenhall which rendered the laying of 24 in. mains practically impossible; indeed, even if a route could have been found it would have been unreasonably expensive owing to the high cost of reinstatement and traffic diversions.

The main laid in the towing-path would be below the water level, and it was known that the canal water was aggressive since it received the discharge of industrial waste from a number of steel processing works. These were using pickling solutions, and although they used neutralising tanks, the water contained sulphur and chemicals which gave the canal the colour of strong tea in parts. Analyses were made of the sub-soil of the towing-path and this was also found to be aggressive containing, among other things, coal outcrops having a high salt content.

It was obvious that some pipe protective measures were necessary and consideration was given to bitumen sheathed pipes. The maximum working pressure in the main was not likely to exceed 10 p.s.i., and therefore cast iron pipes could be used; and taking all costs into consideration, they would be cheaper than steel. I then gave consideration to a surround of concrete and from there it was an easy step to investigate the use of pre-stressed concrete pipes. I had discussions with the Technical Branch of Stanton Ironworks, who manufacture the pipes under licence from the Lock Joint Pipe Company of America. The main discussion centred around the type of joint which is made by a round rubber ring which is rolled into a rectangular annulus on the spigot end of the pipe (see Fig. 2). When used as water pipes the inside and outside of the joint is grouted in with cement mortar. I thought it desirable to protect the rubber from the possible action of the gas, and it was necessary to introduce some degree of flexibility into the joint since the canal contained some gentle curves which scarcely warranted the use of special bends.

Method of Protection

After some initial experiments the method adopted finally was to pack the joint from the inside with a mixture of red and white lead and gold size which was made into a putty-like constituency and trowelled in. The outside of the joint was made with Plastijoint compound bituminous putty having the property of expanding and remaining flexible, in addition to being waterproof and resistant to acids and alkalies. The outside of the joint was then wrapped with Scotchrap P.V.C. tape, which being slightly elastic, held the Plastijoint in position with a certain amount of compression. The pipes were 27 in. dia. inside (at that time 24 in. pipes were not available) and are manufactured as follows:—The pipes consist of a welded thin sheet steel cylinder 16 gauge thick which is welded to socket and spigot ends made from aluminised steel rolled to size so as to be a push fit with each other. The steel cylinder is then tested to 50 p.s.i. and examined carefully for leaks before centrifugally lining the inside with a mixture of $4\frac{1}{2}:1$ granite chips and cement to a thickness of $1\frac{1}{16}$ in. Afterwards the stressing wire is attached to one end and wound on the outside of the steel cylinder. The wires consist of 100/110 tons per sq. in. steel wire .2 in. dia. which are wound on under tension leaving a residual stress of 70/75 tons per sq. in. in the wire. The wire is then firmly attached to the other end. The pitch of the wires is adjusted according to the duty required, which in this case was $1\frac{1}{2}$ in., the pipes having a working pressure of 200 ft. head of water. The outside


H.T.S. WIRES FOR CIRCUMFERENTIAL PRESTRESSING
CEMENT MORTAR GROUT OR BITUMEN POURED AFTER LAYING
MILD STEEL SOCKET REINFORCEMENT
METALLISED STEEL SOCKET RING
MILD STEEL CYLINDER
SPUN CONCRETE CORE
METALLISED STEEL SPIGOT RING
CEMENT MORTAR OR BITUMEN FILLING IF REQUIRED
RUBBER SEALING RING
CORE WALL THICKNESS
COATING THICKNESS
NOM. BORE OF PIPE

STANTON LOCK JOINT CYLINDER PIPES - SINGLE WOUND
RUBBER & STEEL JOINT
SIZES 27" TO 36" INC.

Fig 2.

of the pipe is then covered with a mixture of 2½:1 sand and sulphate resisting cement to a thickness of 1¼ in. The whole pipe is then cured for approximately 12 hours at 140/150°F. Prior to the cover coat being applied the pipe is subjected to a hydraulic test of 300 ft. head of water.

A not inconsiderable problem was the conveyance of the pipes to the trench side. They are 15 ft. long and weigh 2¼ tons each. It was solved by delivering the pipes to a number of selected points by road and loading them on to a staging erected on a canal barge which either delivered them direct to the trench side, or to storage at suitable dumps.

Complicated and intricate operations included the bridge crossings, of which there were six. The space required to accommodate the change in elevation at the bridge ends was very restricted and created quite a number of engineering problems due to the large size of 24 in. special castings. It was necessary to change from pre-stressed concrete pipes to cast iron; and this was achieved with a matching piece as shown in Fig. 3. The cost of 24 in. syphons is quite high and moreover the accommodation required is not inconsiderable. It was thought that the condensation would not be great and therefore a dip pipe was installed, but in case the assumption was wrong, a drain pipe was fixed and sealed up so that if necessary it would be used in conjunction with a side syphon. Experience has shown that in fact there has been practically no condensation. The main was tested in sections as laid at 30 p.s.i. air pressure, the average pressure drop over 24 hours being .038 p.s.i. which is remarkably good.

The use of pre-stressed concrete pipes has been most interesting and has broken new ground, and I have been informed that this is the first time such a pipe has been used for a gas main, not only in this country but in the world. It is not claimed that for normal practice pre-stressed concrete pipes will replace traditional methods, but the experiment has proved that where such circumstances as this arise, the use of these pipes is quite a practical proposition.

New Housing

A large slice of the capital expenditure of boards is to provide mains and services for new housing. Unfortunately the expenditure is not confined to estate mains only as it is inevitable that many of the new estates are sited on the outskirts and fringes of built-up areas, and consequently new feeder mains or reinforcements are required. There is, however, some compensation now appearing in the larger towns in the shape of blocks of flats built on slum clearance and redevelopment sites. The economics of supplying new houses is somewhat doubtful, at least when based on traditional accountancy methods, but we should not lose sight of the fact that the actual life of mains and services is considerably greater than accountancy lives. By the same token a great number of existing consumers must be supplied by assets which have been written off a long time ago.

Since vesting day until February, 1957, schemes to provide mains and services to 193,049 new dwellings were approved at a total estimated cost of £4,788,169, the average cost per house being £24.53. The total cost of all schemes approved by the Board for the same period is £8,984,864. These are estimated costs, but in order to determine the actual costs a number of estates of various kinds were selected for investigation. In all, 277 sites were chosen on which were erected 14,390 houses. To these were laid 14,230 services to which were fixed 13,289 meters, and in these houses 12,153 cookers were installed, representing 85.4%. The average cost of the mains and services was £25.3 per house. The average length of main per house was 11.5 yards.

The Gas Distribution Committee

Shortly after nationalisation the Pipes Committee of the Institution of which I am now Chairman was enlarged so that each area board was represented, and quite recently the name was changed to the Gas Distribution Committee which was regarded as more appropriate to the character of the work; it would have referred to it any technical considerations relating to the supply of gas between the outlet of the gasworks and the inlet to the consumers' meters.

Any unusual incidents or experiences with new techniques or apparatus are reported in full without reservations. This most important aspect not only contributes to the more efficient running of the industry but must have quite an amount of time and money, as instead of 12 boards carrying out experiments only one or two need to do so, and in this respect the Committee are indebted to the boards for their unstinted co-operation.

Apart from the investigations and recommendations which are made to the Council of the Institution and either published in the Report of the Chairman's Technical Committee, presented at the Autumn Research Meeting, or as separate reports or communications, the Gas Distribution Committee also advises on appropriate technical subjects through the Council of the Institution which provides a technical advisory service to the Gas Council. The Code of Practice for Service Pipes was also prepared by the Gas Distribution Committee which for this purpose acts as Panel A. of the Codes of Practice Sub-Committee. In addition, the Committee frequently prepares replies to questionnaires submitted by overseas gas associations in connection with matters which are being studied on an international basis.

One of the earliest recommendations made shortly after vesting date was that concerning the internal protection of steel pipes by the use of red lead. This recommendation was based on the results of a series of long-term corrosion

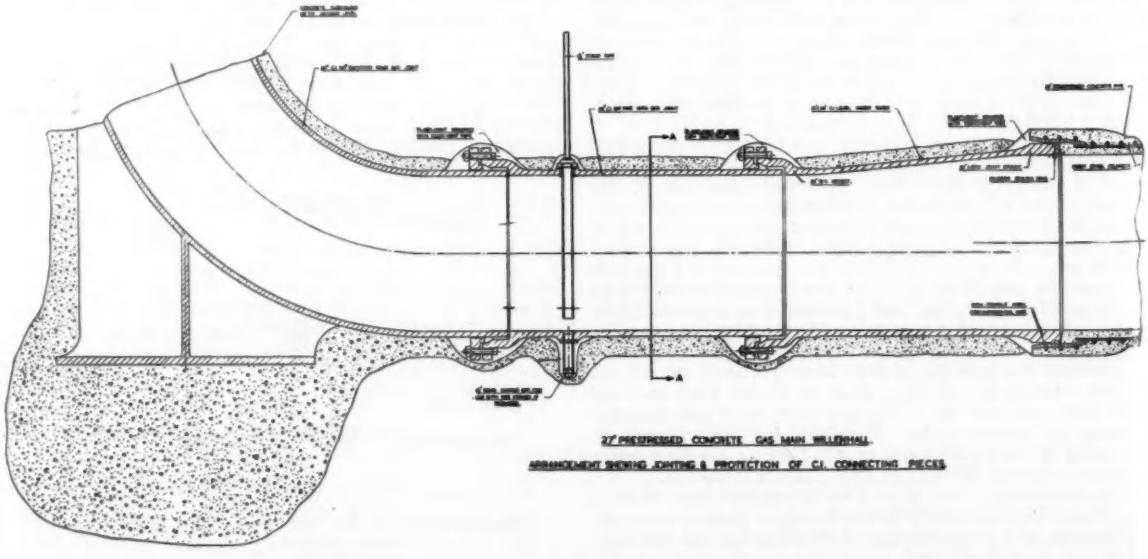


Fig. 3.

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tests carried out in Newcastle and Birmingham in collaboration with the steel pipe manufacturers. This was reported at the Autumn Research Meeting, 1953, in the Chairman's Technical Committee Report.

As far as service pipes are concerned, the extra cost amounts to 7½% on the tube, or 1d. per ft., and if one assumes that the cost to lay an average service pipe is £8—10, this represents an increase of 2½%-3½% which is a small price to pay for what we hope will be the complete elimination of service clearing. It will, of course, take some time before all services are red lead lined but the prize is quite considerable. I have no precise figures of the annual cost of service clearing but I should say that the cost to each board is of the order of £20,000.

The Committee is now turning its attention to the *external* protection of steel pipes, especially for service tubing. The increased use of the 'Holiday' detector has disclosed that the present day traditional method of external protection is by no means perfect, although in all fairness it must be admitted that complaints due to external corrosion have not assumed large proportions, but this may be due to the fact that extensive use of wrapped tubing only dates from the shortage of timber required for 'pitching and troughing' in common use before the war. The 'Holiday' detector has disclosed cracks and pinholes which are for all practical purposes invisible and which may encourage the onset of corrosion, especially in aggressive soils, although it has been claimed that where the dielectric strength is low the 'Holiday' detector will produce a perforation where none existed before the test. A further point is that most of the wrapping in this country is bitumen based, whereas with site wrapping as practised in America, the Middle East, and elsewhere for natural gas and oil pipe lines the protection has a coal-tar base which, generally speaking, is softer but may nevertheless produce a more homogeneous coating. There are also difficulties in the practical application of coal-tar products under factory conditions due to the unpleasant fumes. All these matters are being examined by a small Sub-Committee of the Gas Distribution Committee which has been set up to collaborate with the manufacturers.

Another investigation which in my opinion has been most valuable, is that leading to the recommendation on the testing of high-pressure gas mains and the use of the S.E.G.B. deadweight tester. It is of necessity an accurate instrument since it was developed from the deadweight tester used for the calibration of pressure gauges. My own Board has been using it since 1951 with great success. So far over 900 tests have been carried out and every medium and high-pressure main has been laid to the Board's tolerances which are very slightly more generous than the Institution's scale of allowances.

Test Certificate Issued

A test certificate is issued and copies sent to the contractors and/or the engineer-in-charge. At first the contractors were a bit dubious, having been used to the 'bottle-tight with a Bourdon gauge' technique and even installed this in addition as some of the gangers were suspicious of these 'new fangled ideas.' The early tests rapidly indicated the great inaccuracies in the Bourdon gauge method and the continued use of the deadweight tester has improved the standard of mainlaying out of all recognition; whereas the failures were very frequent in the early days, these steadily decreased over the years.

I should make it clear that in my opinion it is desirable, almost essential, to have a trained man to operate the instrument and who is continually using the instrument. Some people have reported difficulties but I think they are due to the operator; I do not think the usual type of mainlaying foreman or ganger is a suitable person. My own Board has equipped a small van with this and other instruments and the driver-operator (who was a qualified gas fitter) covers the whole area. The cost of this service is recovered many times over by the prevention of potential gas leaks. A small leak on a main not only goes on from hour to hour but year to year; a very simple calculation of the cost of the gas lost will verify this statement.

There is a great shortage of technical literature on distribution technique, especially on the practical aspect of main and servicelaying. This is particularly unfortunate as bad practices not only create severe maintenance problems but can be the source of most serious leaks leading to accidents to both persons and property. A further complicating factor is that the supply of qualified main and service-laying personnel is severely restricted. It is hoped that the Gas Distribution Committee's Recommendations for Mainlaying, Publication No. 491, will do much to improve matters and my Board has distributed 400 copies to appropriate personnel.

The Committee also thought it wise to include in this publication the 'Recommendations to prevent accidents during the cutting out of gas mains for repairs and alterations,' originally published as Communication No. 473, as it is generally held that if the recommended procedure had been adhered to some of the serious accidents which have occurred when carrying out such work would have been avoided.

Some time ago I suggested that it would be advantageous to have a standard flexible joint for cast iron pipes as is the practice in America. A small Sub-Committee was formed to meet the cast iron pipe manufacturers and out of this grew the Cast Iron Pipe Liaison Committee. Unfortunately the pipe-makers were not able to agree a standard joint due to the high cost of alterations to tools and plant but a number of useful matters came out of the discussion, particularly in respect to the corrosion resistant properties of the die-cast iron bolts. The pipe manufacturers' technical representatives went to America and collected much useful information which was communicated to the Committee. From the discussion a specification for the joints and bolts was drawn up, together with details of all flexible joints and methods of making the joints, which has now been included in a booklet entitled 'A Manual of Flexible Joints' which is now obtainable from the Cast Iron Pressure Pipe Manufacturers' Association.

Training of Main and Servicelayers

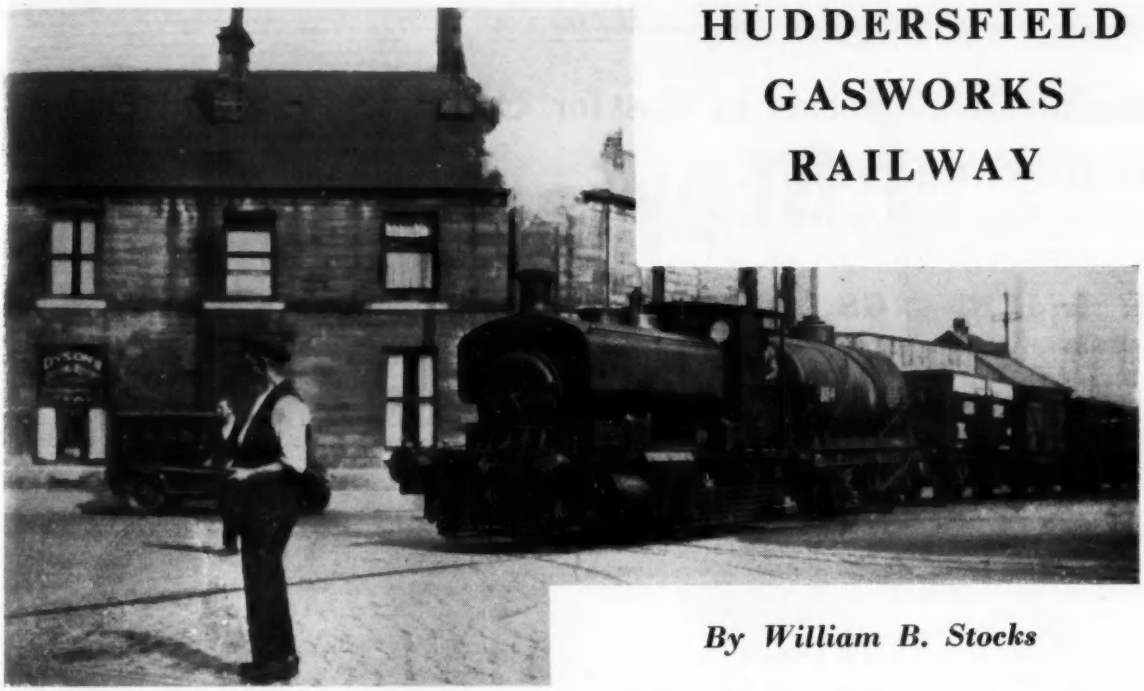
The Board has decided to set up a main and servicelaying training course in an endeavour to improve the standard of workmanship and to bring the personnel up to date with the best and modern methods and to attain a reasonable level of mainlaying practice throughout the area. I think it will be readily acknowledged that the present standard leaves much to be desired and this state of affairs arises from the fact that the majority of the skilled men arrive at that position by picking up their knowledge as they have progressed from what used to be known as the 'pot boy' or from a labourer. I have no wish to deprecate the work done by many men but the point is that they would do much better if they had had some training—I am quite sure that such training will be appreciated by the men. The background of knowledge and their usual working conditions creates an attitude which requires a special approach which must be different to the training of other personnel, such as gasfitters. With this in mind it has been decided that classroom work shall be reduced to a bare minimum. The class will be quite small—about eight men—and it is intended that they shall work as one or two gangs in actual mainlaying operations, the training being carried out on the job. Two sites have been chosen which are on works sites where gas making has been abandoned and where there is a large, open-sided shed—usually the purifier shed—so that the men can carry on during inclement weather.

The lecture room is quite simple so as to avoid the 'schoolroom' atmosphere and all the associated paraphernalia. The provision of overalls is regarded as more important than paper and pencil. It is considered that the usual type of labour is not amenable to staying in hotels or hostels and therefore each centre is intended to cover an area of 25 miles radius so that the men can go home at night. The course will extend over two weeks—ten working days.

Another important point is that the basic principles of training must be agreed by all levels of distribution staff to avoid the 'Never mind what you have been taught, do it my way' attitude. This can be avoided by agreeing that 'my way' is being taught. Considerable time and thought have been given to preparing a syllabus and comprehensive notes outlining the practices to be taught.

A permanent instructor has been appointed who has been a practical man and the Education Officer has sent him to a number of courses, such as T.W.I., Job Instruction, Job Relations, and Craftsman Instruction. Full use will be made of models, diagrams, and other visual aids. At the moment the object is to train existing personnel. This may take about 18 months; we shall then give attention to the use of special equipment, and finally to a complete *ab initio* course.

HUDDERSFIELD GASWORKS RAILWAY



By William B. Stocks

The railway crossing Bradford Road. A flagman precedes each train.

THERE is always a special fascination in the spectacle of a steam locomotive and train working on a public highway. This is no doubt due to the rarity of the sight in this country coupled with the attraction of a vehicle working out of its familiar element.

Among the railway features of Huddersfield is the gasworks' line that traverses about a quarter of a mile of public road, including the crossing of two main roads, on its route between the gasworks and the junction with British Railways at Newtown Yard. Originally these main-road crossings were also crossings with Huddersfield Corporation Tramways (Bradley, Brighouse and Sheepridge routes), but the abandonment of the tramways, completed in June, 1940, eliminated these crossings.

The line was authorised by Parliamentary Bill and consists of a single track through the street and a further stretch of private right-of-way between the extensive works layout and the transfer sidings at Newtown Yard. In addition to these sidings, and including the internal tracks at the works, there are over a mile of tracks.

The first train-load of coal was worked in February, 1922, and it is estimated that, up to 1947 5 mill. tons of coal alone had been moved over the railway. This excludes the transport outwards of gasworks by-products and of machinery, etc., inwards.

TWO LOCOMOTIVES

Two locomotives of identical design are employed. They are 0-4-0 saddle-tank engines by Andrew Barclay and Son, Ltd., Kilmarnock, bearing works numbers 1726 and 1727. The following technical data is of interest:—

Length of stroke	22 in.
Cylinder bore	14 in.
Diameter of wheels	41 in.
Wheelbase	66 in.
Steam pressure	160 p.s.i.
Heating surface	618 sq. ft.
Fire grate area	9½ sq. ft.
Capacity of tank	700 gal.
Weight (empty)	22¾ tons.
Weight (working)	27¾ tons.

Guards are fitted round the frame to protect the wheels and motion during street working, and coke is burnt to eliminate smoke nuisance. In Huddersfield Corporation days the locomotives were painted maroon, but since the nationalisation in the gas industry they have appeared in the standard shade of brown used by the North Eastern Gas Board.

The locomotives are extremely well maintained, and usually work on a fortnightly rota alternately. Quite heavy repairs are undertaken by the engineering staff of the gasworks to the extent of re-wheeling and re-boilering when these become due. The motive power once included a steam shunting-crane, by Thomas Smith, of Rodney, but this was scrapped in 1944.

A maximum load of nine wagons is permitted to work through the street section due to the descending gradient between the yard and the works. A flagman precedes each train, and most of the wagon brakes are pinned down before descending.

EIGHTY WAGONS

Prior to the nationalisation of the railways the works owned over 80 wagons, which were lettered Huddersfield Corporation Gas Department.

In its comparatively short overall length the gasworks railway forms part of some interesting concentrations of transport methods and periods. Immediately on leaving the works the line crosses the historic Ramsden Canal, completed in 1780, by means of a handsome reinforced concrete single-span bridge, and then proceeds to cross the main Huddersfield-Leeds road. After climbing Beaumont Street, during which it passes the Huddersfield Corporation trolley and motor bus depôts, it crosses the Bradford-Huddersfield road. It then leaves the street section through an arch in the viaduct carrying the main Leeds to Liverpool railway into Huddersfield Station.

At Newtown Yard the gasworks line finally ceases by making contact with the lines originally laid down by the Midland Railway Company, and opened to goods traffic in 1907. This was part of an ambitious scheme promoted by the Midland in the closing years of the last century to develop traffic in the West Riding of Yorkshire, and though this branch fell far short of the original expectations, it has, at least, made possible this unique and interesting gasworks railway.

I would like to express my debt to the officials of the North Eastern Gas Board at Huddersfield whose kindness enabled me to examine the line closely, and who assisted me with data.

This article appears by permission of the *Model Engineer*.

From a paper to the Midland Junior Gas Association, March 26

Recent Developments in Gas for Cremation

By H. W. GROVER,
SENIOR INDUSTRIAL GAS ENGINEER, NORTH THAMES GAS BOARD,
and
A. C. JENNINGS,
INDUSTRIAL GAS OFFICER, WEST MIDLANDS GAS BOARD.

AFTER a slow start, despite enthusiastic work by the Cremation Society, formed in 1874, the position to-day is that approximately 25% of all deaths in this country are cremated, while in the London area the figure is 65%. Cremation is now required to precede burial in St. Paul's Cathedral or Westminster Abbey.

There are many people who have never visited a crematorium and probably are not aware of the layout of such an organisation. Of the buildings the chapel will naturally be the dominating feature and its size must depend on the population it is intended to serve; usually a minimum of 50 to a maximum of 200 people are accommodated. The chapel of a modern crematorium is usually light, airy, and restful, free from mural memorials, and windows are generally in clear glass giving a view of the sky and trees, sometimes through a colonnade to the Garden of Rest. Orientation of the chapel is not essential though it is preferable and the catafalque is normally placed at the East end. A separate entrance and exit to the chapel should be provided, and there is usually a waiting-room with windows overlooking the drive so that the cortège may be seen approaching. People often have to come quite a long distance and it is much more pleasant to wait in such a room than in the chapel itself. The larger crematoria have facilities for hot drinks and light refreshments. There is also a vestry for the clergy and lavatory accommodation for each sex, generally near to the waiting room.

Adjacent to the catafalque there is a receiving chamber or committal room, into which the coffin is delivered at the point of committal in the ceremony or afterwards, depending upon the arrangements. From the committal chamber coffins can be introduced through the front doors of the furnaces or cremators, which are so arranged that these doors form a port in the dividing wall between the committal chamber and the furnace room. In certain cases facilities are given for relatives of the deceased to see the coffin actually placed in the cremator, and this part of the building should therefore, be designed to be as bright, clean, and restful as possible. Particular care is taken to ensure that the chapel is insulated acoustically from disturbing sounds.

Operation and Maintenance

The crematory is designed to give adequate space for operation and maintenance of the cremators and ancillary equipment. The floor is usually tiled or composition, so that it can always be kept clean, and leading off the crematory there are additional offices for maintenance of records, storage of urns, housing of fans, gas meters, etc., and the plant for the preparation of ashes, also for the provision of heating equipment where central heating is employed at the chapel.

Surrounding the buildings there is a drive and this is generally arranged so that the various cortèges enter and leave by separate entrances, and the drive is of such a layout as to minimise the risk of interference of one cortège with the next. Methods of handling the coffin after committal are various. The catafalque is generally a raised dais 4 ft. high by 3 ft. 6 in. wide and 10 ft. long, upon which the coffin is placed by the bearers. This, of course, is the central feature of the chapel and will be suitably lighted.

The coffin may be transported to the cremator resting on the catafalque and mechanically and slowly passed through specially designed doors in the wall of the committal chamber; alternatively, the whole catafalque with the coffin, is passed through in a similar manner; or, resting on the catafalque, and suitably draped, it may slowly descend through the floor of the chapel to the committal chamber below, or be placed in a recess, either a curtain or doors being slowly drawn across during the committal sentences. The coffin is subsequently removed.

The disposal of human remains by cremation is regulated in this country by the Cremation Act of 1952 which follows a previous Act of 1902, and Statutory Rules and Orders No. 1016, issued in 1930. The Act limits the location of a crematorium, stating that unless written consent of the occupier is obtained, no crematorium may be built within 200 yards of a dwelling house, or 50 yards of a public thoroughfare. The proposed opening or, in fact, closing of a crematorium must, in all cases, be advised in writing to the Home Secretary, and requires his approval.

Certificates Required

Before a body may be cremated, certificates are required from the medical practitioner attending the patient, and a confirmatory one from another medical practitioner of at least five years' standing who must not be a partner of the first one, or a relative of the deceased. Before a cremation will be accepted the permission of a medical referee attached to the crematorium is required. Such a medical referee would also be a medical practitioner of not less than five years' standing, and he has to be convinced that the causes of death were not due to violence, poison, etc., and that there could be no objection to the cremation by close relatives of the deceased. The medical referee need not give any reason whatever for his refusal of permission for cremation to take place. In circumstances where a post mortem examination has been made and the cause of death has been certified by a coroner who has given his certificate, two medical certificates are not required.

Most crematoria have their own regulations based on a code of cremation practice, drawn up by the Cremation Society. A crematorium is a non-denominational authority and, therefore, emblems and symbols of religious faith are not necessarily displayed as a permanent feature; it is not usually permitted to erect a crematorium upon consecrated ground. This is why one seldom sees existing chapels converted into crematoria. It is not suggested that this would be a good thing because a crematorium requires to be functional above everything else and planning from a fresh start is obviously better. From an aesthetic point of view it is a bad thing for a cortège to pass through a graveyard. The cremation movement tends to get away from all this and prefers the cortège to pass through well designed gardens of rest.

Rules for disposal of the body are that only one body may be cremated in a cremator at one time, the only exception being where a mother and newly born child are concerned; once a coffin, with its contents, has been received by the cremation authority, it is not touched or interfered with until the process of incineration is complete; and ashes resulting from each cremation must be kept separate in accordance with the Code. Following removal from the furnace, the ashes are reduced to small particles by mechanical means,

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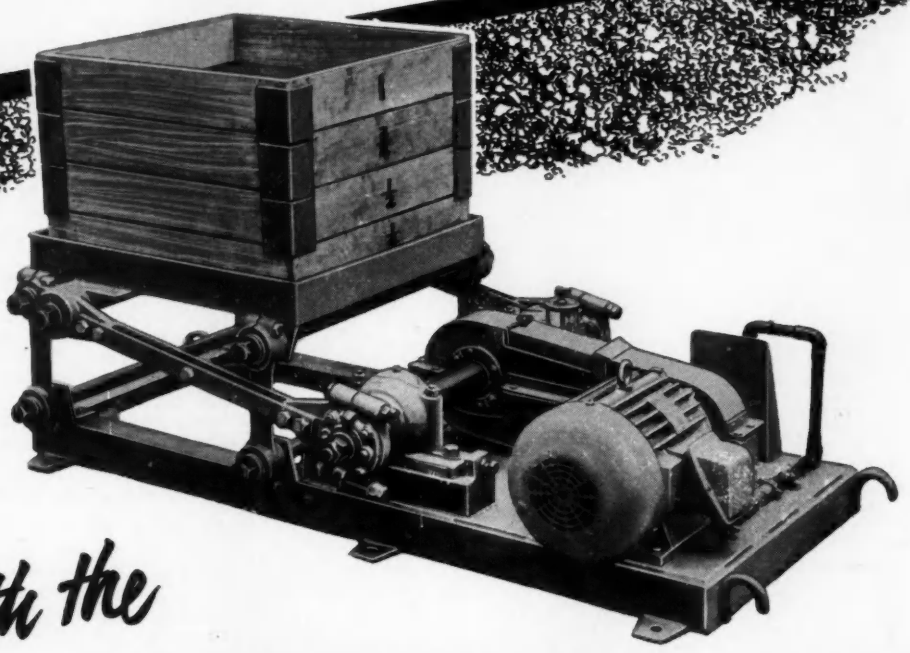

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and placed in separate containers while awaiting final disposal If the ashes are to be scattered in the Garden of Rest the ceremony is conducted with the greatest reverence and respect. In cases where ashes are sent by rail or through the post, specially constructed containers are provided for this purpose, suitably labelled.

The conception of cremating the human body has changed since the days when gas furnaces were first designed. The problem is analogous to that concerned with the design of a special burner. In other words, if we aim to set up the equipment required to deal smokelessly with a highly volatile material, we are some way towards examining the same problem. Cremation can be divided into three phases—ignition, volatisation, and combustion and calcination. These phases, very easily overlap and cannot be separated in terms of time. The ignition phase is the only one in which extraneous fuel plays a major part. The rest of the process follows from this, although it may well be that in certain circumstances ignition temperature is lost and re-ignition may be required.

It is not a question of using a large quantity of gas to resolve the body and the coffin, because the body and the coffin are themselves fuel and must be regarded as such for this purpose. After ignition, volatilisation follows and it is here that there is the greatest potential heat release and susceptibility to smoke formation. The volatiles must be brought into contact with sufficient quantities of air for complete combustion, while they are still above ignition temperature. Many gas fired cremators in use have provision for the admission of secondary air under pressure, but it is essential that this air is intimately mixed with the volatile gases produced. Care must be taken with the size and positioning of the air inlets, size of the exit flues, and streamlining of the path of the waste gases, so that rapid combustion of the charge is not retarded when the need is greatest.

Theoretical heat release and air requirements of an average case have been calculated. Assuming a body to contain 80 lb. of water, the net heat available after deducting that required to evaporate the water is approximately eight therms, including the heat available in the coffin. The theoretical air requirements completely to burn the material is of the order of 12,500 cu.ft. These figures relate to an average case but cannot be taken as a guide in designing a suitable furnace. The actual quantities of air to be provided depend, among other things on:

Air Requirements

1. The state of the body, that is, cause of death. Where this has been due to a long, lingering illness and the body is wasted, its calorific value is much reduced, and the volatiles available are also reduced. On the other hand, where the deceased is fat, the amount of gas required will not be very high but the length of time is increased and the amount of air necessary will also be increased. Similarly in cases of dropsy very large quantities of water have to be evaporated. The process of embalming or sanitising must also be considered, as this process is growing. Recent experience at a leading crematorium has indicated that the cremation times have been appreciably increased with a consequent increase in gas consumption. The viscera are made hard and leathery by the formalin used, and it has been necessary to attack them by flame impingement in order to obtain quick resolution.

2. The presence of high calorific value combustibles in the coffin, for example pitch and other material required to make the coffin water tight. These will require large quantities of air, if smoke is to be avoided, because the heat release is rapid.

3. Air requirements will depend upon the efficiency of mixing of the air available with the gases available from the case.

4. The temperature at which the furnace is operating. Efficient operation of a cremation furnace calls for a high degree of variability and control of air flow so that the air can do its work to the best advantage.

Bearing in mind the problem, it will be seen that the natural advantages of gas place it in a pre-eminent position as the fuel to be used for ignition, the main advantages being that it is ready at all times for immediate use, it is unsurpassed in controllability, it is itself free from smoke, it is clean in operation, and it is economical. There have been rare cases for which the furnace engineer could not be expected to design, examples being a glass topped coffin submitted for disposal, explosives placed in the coffins, and use of bullet-proof steel coffins as has occurred in America.

Modern types of gas furnace include the Lawnswood Ne-gas cremator, the incandescent 'Duo-Verse' cremator, and the West Midlands 'Diamond' cremator. The Lawnswood is described in British Patent Specification 748489 and comprises generally a furnace having a hearth and open firebars—Fig. 1. Ignition is by means of burners of the neat flame type arranged in the roof of the furnace. Products of combustion and distilled gases are drawn through the ash chamber to flues by means of suction generated by induced air-operated eductors. The eductors are placed above the arch of the furnace and extract the products of combustion and push them forward to the stack. The furnace is also equipped with a refining chamber through which the products of combustion flow. The holders of the licence, from the North Eastern Gas Board to build this furnace, are the Dowson and Mason Gas Plant Co., Ltd., of Manchester. This firm have fairly recently indicated a modification in the design.

Dual Operation

In their latest design the furnace builders show two fairly conventional Lawnswood Ne-gas cremators, built side by side with a connection port between the dividing wall. In this way they arrange for the volatile gases given off in the distillation phase to be diverted so that their combustion takes place in the other chamber in which there may be a cremation taking place which, if in a more advanced state of incineration, may benefit from additional input of heat. The installation, from a technical point of view, may have something to commend it when built in a very busy crematorium, and the performance of such a furnace will be watched with interest.

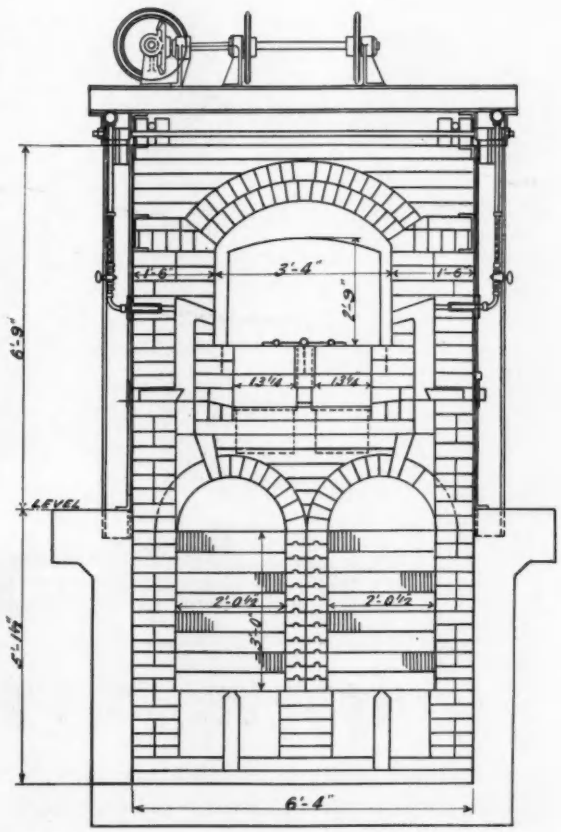

Fig. 1. The Lawnswood Ne-gas cremator.

The incandescent heat 'Duo-Verse' furnace (see Fig. 2) was built to show what could be done by using a high degree of regeneration. The design was well engineered and there are points about it which are modern, in conception and it is important that it should be mentioned. It is the first fully regenerative type of cremator to be marketed in this country and the method of firing has been widely used in the metallurgical industries for a great many years. The regenerator works on a short cycle and is specially designed to eliminate the possibility of blockage by dust carry-over. The furnace is equipped with 22 neat gas burners, 11 being fitted in each side wall and both sets being used to pre-heat the furnace. One set fires across the combustion chamber while the opposite set are fired downwards into the regenerator. The change-over takes place every 60 seconds. The multiplicity of air ports above and below the charge are designed to give intimate contact and so to increase the speed of combustion to the charge. Tests on a prototype indicate that once heated the cremator is capable of dealing with the charge very quickly and times of less than 35 minutes have been recorded with a charge made up to resemble as far as possible human remains.

Recuperation Problems

The first prototype of the West Midlands 'Diamond' cremator was designed by the late Mr. J. F. Waight in consultation and collaboration with the Chairman of the London Cremation Co., Ltd., Mr. G. le B. Diamond, and constructed at Golders Green Crematorium. This prototype provided valuable information on the problems of recuperation and the advantages to be derived from the various types of burner equipment and led to the construction of a second prototype cremator.

Recuperation is not included in the 'Diamond' design, stress having been laid on the construction of a cremator with a very low thermal capacity. Whenever possible, lightweight high temperature insulating refractory bricks are used, which have a thermal capacity about one-third of the normal Scotch brickwork previous used. The main advantage derived from this construction is that since the cremator very quickly attains the ignition temperature, fuel consumption may be reduced. With the more solid type of construction the first and second cremation times were often prolonged, due to the delay in attaining cremation temperature, whilst as the day wore on, the cremator temperature increased. Another point concerning the more solid design was that when the cremator was working at a high temperature there was a very quick release of volatiles in the early stages of the cremation and very often there was an inadequacy of air to eliminate smoke completely.

In the 'Diamond' cremator the question of air availability has been given great consideration and it is possible to provide and use as much as four or five times the quantity of air per hour allowed in some other designs. A further point on this cremator is that the area beneath the hearth is much larger than on previous types. This is provided purposely to give plenty of combustion space. When the cremator is giving its highest heat release the combustion of volatiles takes place under the hearth area and unless there was adequate combustion space there would be difficulty in obtaining complete combustion of all the products evolved. Not only is the under-hearth combustion space adequate but the flues throughout have been designed to provide sufficient chimney effect so that at all times there is a slightly negative pressure in the cremating chamber. It is quite possible to work throughout a complete cremation with the cremation chamber rear door open, without any tendency for combustion products to enter the furnace room.

Other features of this cremator are the type and position of the burners. The burners are of special design using air under pressure with a total gas capacity of 1,500 cu.ft. per hour, quite silent in operation and incorporating a patented non-blow-off tip. Each burner is separately controlled as to gas and air by means of Teleflex control cables, brought to a control panel at the rear of the furnace. These burners are located towards the front of the furnace where the heaviest section of the case has to be dealt with. If this section can be resolved the rest of the case will take care of itself. The fire-bars are of heat resisting cast iron and constructed to allow direct radiation from the arch to pass between them thus heating the under-hearth combustion space. It is very necessary that this section of the furnace should flash as quickly as possible to maintain ignition temperature. Air jets are provided under the hearth and arranged to give intimate mixing with the evolved volatiles, and further air is arranged in the side flues to deal with any tendency to smoke. The bottom of the ash hearth is dished to allow any liquids which may come through the grid to be held pending re-evaporation.

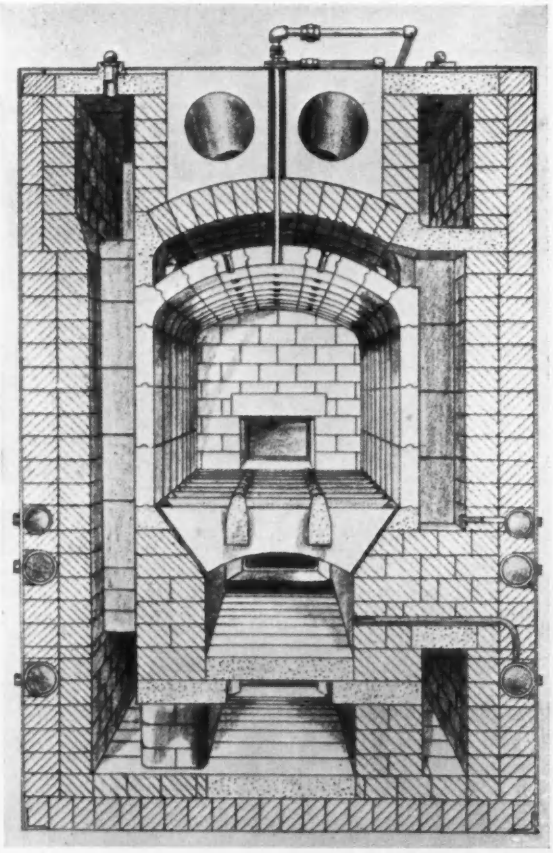

Fig. 2. Incandescent heat 'Duo-Verse' furnace.

Under Separate Control

A special feature is an ash refining chamber which is heated by means of an air blast burner under separate control and having its own separate air supply. The products of combustion from the main chamber do not come into contact with the refining hearth and there is, therefore, no question of any remains not being kept entirely separate when ashes are being refined on the hearth during the course of a further cremation.

Looking ahead over the next ten years and considering the way in which cremation design will progress, bearing in mind the trend of design already apparent in industrial gas equipment designed for other fields, there appears a possibility that a design substantially similar to the 'Diamond' cremator, but having no gas burners at all in the structure, may be achieved. Instead of burners in the arch there may be high temperature refractory ducts feeding in air at temperatures in excess of the ignition temperature of the case, possibly in excess of 1,000°C. Some of this air could also be conducted under the hearth, and into the side flues. If this could be achieved the inherent difficulty of the fuel required for ignition using the oxygen available for combustion of the case would be overcome. Recent developments using quick cycle regenerative type air heaters and making use of heat resisting cast slugs may point the way to such new developments as have been envisaged. Whatever transpires there can be no doubt that the gas industry will continue to play its part in the design of equipment which will ensure a reverent and dignified thermal transmutation of the human body.

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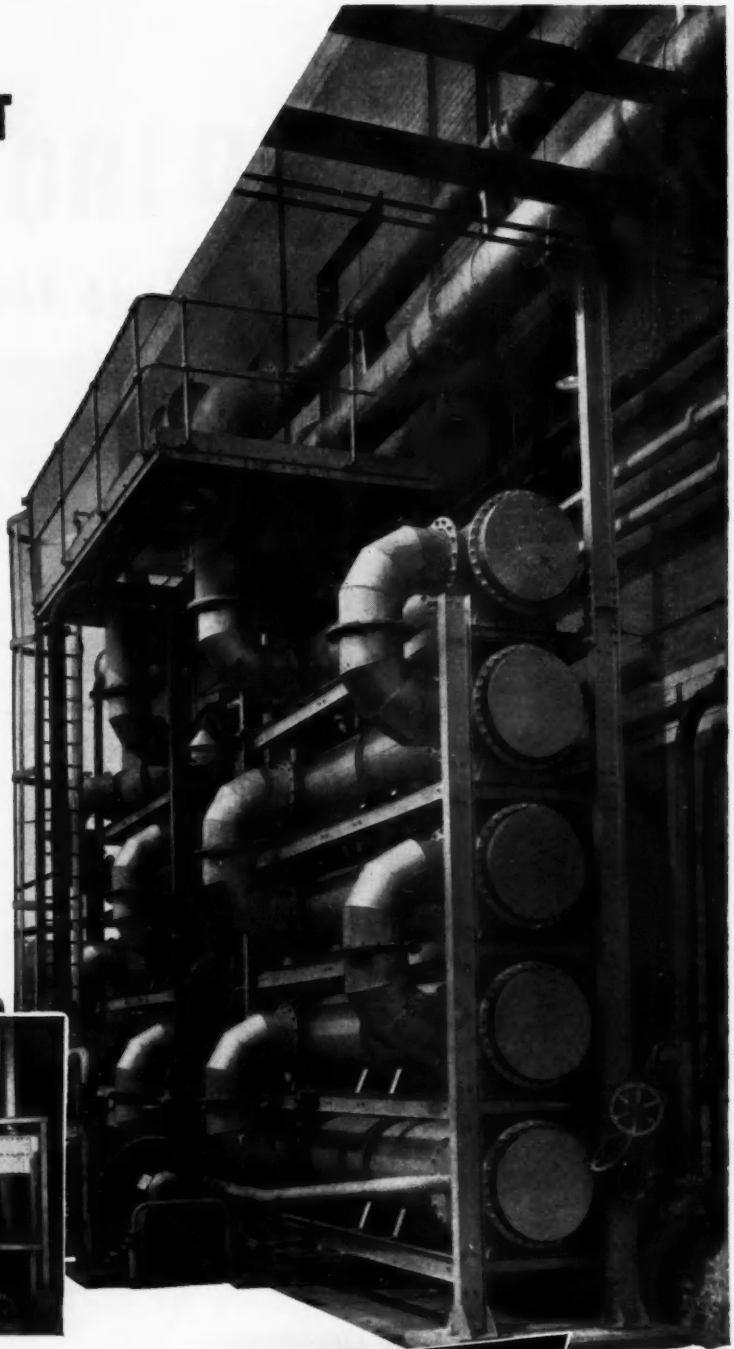

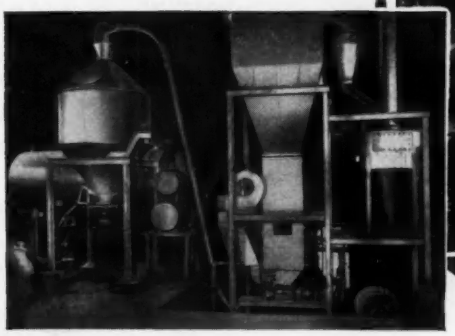

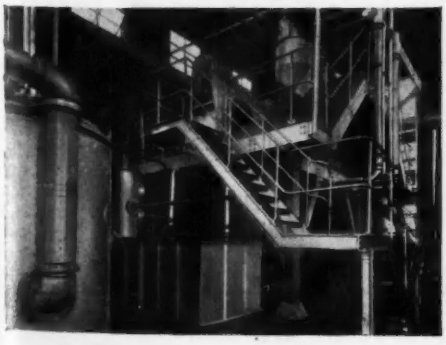

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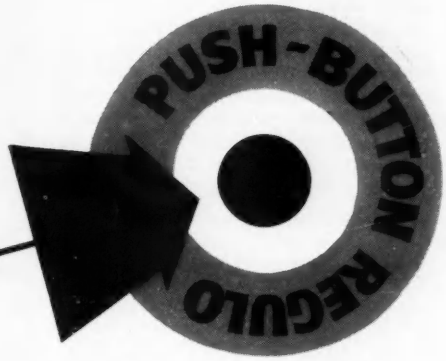

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Trade News Supplement

Liquid Filters Need No Tools For Servicing, Claim Makers

A NEW liquid filter designed to meet the requirements of the oil, chemical and food industries in particular has been added to their range by Plenty & Son, Ltd. No tools are required for servicing even the largest filter, claim the Company. There is no spillage when removing the filter cage for cleaning, no need to renew the gasket, since a special synthetic 'O' ring joint is used which is self sealing under vacuum or pressure, withstanding long use and repeated removal and replacement of the cover.

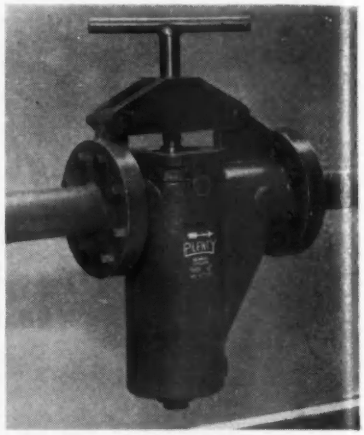
Due to the special design of the cover, gas pockets cannot form within the filter, which has no space above the level of the inlet and outlet pipes. The cover is shaped to prevent the seal face coming into contact with the floor or ground, thus protecting it from damage or dirt.

A very large filter surface is provided —over 12½ times the pipe area. This gives long periods between cleaning and a low pressure drop. Vent and gauge connections are provided at inlet and outlet, and on both sides of the body. There are alternative bottom or side drains to suit all site conditions. The liquid passages within the filter are of large area and smoothly shaped to give the least possible restriction to the flow.

Standard Plenty filters have bodies and covers of close-grained, shot-blasted cast-iron. The flanges are made to ASA. or BSS. dimensions. Filter cages are of steel for oil service, brass or copper for water service. They normally have $\frac{1}{16}$ in. perforations. All standard filters are designed for 300 lb. per sq. in. gauge working pressure, tested to 450 lb. per sq. in. gauge.

Filters having finer, or coarser elements are available to suit requirements, in steel, copper, monel, etc., and they are also available with bodies of cast steel, stainless steel and gunmetal. Special filters can be supplied for higher working pressures.

The cover of the filter is spigotted into the body and held in position by a hinged strong back and captive hand screw. The 'O' ring joint is recessed in the body. No force is required in making or breaking the joint and reassembly is just as easy, clean and quick. The cover only requires hand tightening even for the highest pressures. It is self-locking. —*Plenty & Son, Ltd., Eagle Iron Works, Newbury, Berks.*



MELTING FURNACE FOR CABLE PRESSES

FOR the melting both of pure lead and lead alloys, the Monometer Manufacturing Co., Ltd., have developed a series of furnaces fitted with automatic temperature controls and safety devices, of capacities from 1 to 5 tons.

Oxidation during the progress of the melt is practically prevented by the protection of the anti-oxidation hood which is fitted with anti-splash loading doors, and the container of the adjacent lead press is fed through the valve outlet of the furnace with metal from the bottom of the melting pot. This not only permits close control of the amount of metal fed into the press, but also ensures that this metal is prevented from exposure to oxidation, which would make the extrusion of a high quality sheath difficult.

Heating is usually carried out either by venturi-bunsen burners operating on town gas or Selas gas at normal mains pressure without any air blast, or alternatively by fuel oil.

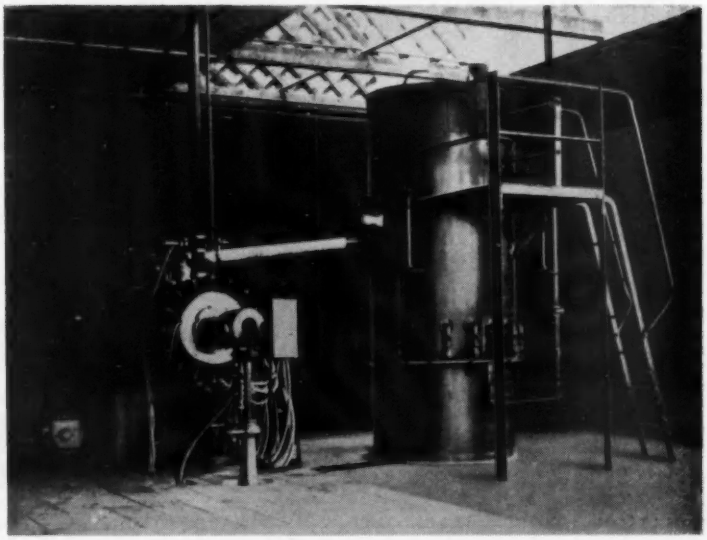
The temperature of the metal in this type of Monometer furnace is automatically controlled by a Capacitrol or electronic controller. The primary sensing element in this system is a thermo-couple, inserted in the molten metal which transmits variations in temperature to a metering element which has been preset. As the control point is reached an oscillating circuit is interrupted which effects the necessary relay action and through a motorised valve controls the gas supply to the burners. The temperature of the melt can be controlled by this means to any desired setting to within about plus or minus 5°F. Fuel consumption, too, is reduced to a minimum.—*Monometer Manufacturing Co., Ltd., Savoy House, Strand, London, W.C.2.*

BROADCASTING IN A NOISY WORKS

A NEW bulkhead microphone control unit specially designed to meet the requirements of factories and machine plants where a high noise level makes the use of normal communication methods unsuitable, is being marketed.

A typical system consists of a central amplifier and a number of bulkhead microphone units, with associated loudspeakers, placed at key points throughout the plant. An operator wishing to make an announcement presses the 'call' button, which produces a warning note in all the loudspeakers in the network. He then presses the 'speak' button, and holds it depressed, while broadcasting the message.

The bulkhead unit has a robust cast-metal housing and is weatherproof.—*Communication Systems, Ltd., Strowger House, 8, Arundel Street, London, WC2.*



Alloy melting furnace for directly running metal to a cable sheathing machine.

CONSOLIDATING NARROW TRENCH BACKFILL

THE Wacker BS. 50/3 Vibro-rammer was designed primarily for backfill consolidation in narrow trenches and thus lends itself admirably to such work as main laying.

The action is a combination of vibration and percussion obtained by an oscillatory spring system, giving a variable frequency of 450/650 vibrations per minute. Each vibration provides a short-stroke percussion blow of about half a ton with the 14 in. by 12 in. rectangular shoe. Forward motion is automatic.

Minimum Risk

The emphasis on consolidation by vibration gives one particular advantage, at least to the gas industry. Work can be carried out near and above cast pipes with a minimum risk of fracture. Maximum efficiency is obtained if the material to be compacted is deposited in layers of 9 to 12 in.

Consolidation around the sides of pipes can be obtained without disturbing the bedded position of the pipes.

The Wacker BS. 50/3 can also be used on bituminous toppings. Clay and other cohesive material are also compacted successfully.

Easy to Handle

From the operator's viewpoint, the Wacker Vibro-rammer has everything in its favour. The absence of violent jumping makes the machine easy to control. The guiding handle, bearing the Bowden cable throttle control, is isolated from the vibration by rubber shock absorbers. The rammer is safe to use and easy to handle in and out of trenches—dead weight is only 110 lb.

The BS. 50/3 is simple to maintain, comparatively light on spares and uses about a pint of two stroke fuel per hour. It is supplied in a strong lock up storage case, specially designed to clamp the rammer firmly in a protected position during transit.—*David Roberts & Co. (Engineers), Ltd., 276, Monument Road, Birmingham, 16.*

Illustrating the use of the Vibro-rammer for compacting the back fill in a narrow trench. Each vibration provides a short-stroke percussion blow of approximately half a ton with the 14 in. by 12 in. rectangular shoe. Forward motion is automatic.

Industrial Actuators

The English Electric Company has issued a new publication describing its type 291 industrial linear actuator equipment, which consists essentially of a three-phase induction motor driving a screw jack through reduction gearing.

These actuators can operate a load of 3,000 lb. with a stroke of 8½ in. in 35 seconds. The position of the actuator arm is indicated on a flush mounting ratio type instrument.

A major application of these actuators is for precise control of boiler flue dampers from a central position.—*The English Electric Co., Ltd., Queens House, Kingsway, London, W.C.2.*

Glass Fibre Fabrics

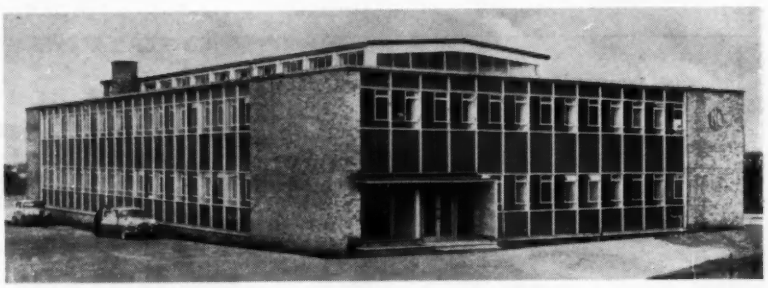
THREE years ago, Turner Brothers Asbestos Co., Ltd., Rochdale, began to manufacture under the registered trade mark Duraglas a range of glass fibre yarns and fabrics—several qualities of which will be on show on the company's stand (No. 72) at the 2nd National Industrial Textiles Trade Fair, Royal Albert Hall, April 1 to 5.

Duraglas materials embody an extraordinarily useful combination of physical and chemical properties. They are resistant to most alkalis and acids. They are incombustible. They have good electrical resistance. They are not attacked by bacteria, fungus, vermin or insects.

By far the largest application for *Duraglas* fabric, at present, however, is as a plastics reinforcement, for which it is ideal. Reinforced plastics incorporating *Duraglas* have a higher strength/weight ratio than mild steel.

It is used as a protective covering for steel pipes, and is extremely useful when moulded into items for use where sulphurous or corrosive fumes are prevalent.

Quite apart from *Duraglas*, Turner Brothers Asbestos Co., Ltd., are well known for their asbestos products, some rather specialised examples of which will also be on show at the Fair. Among other items will be a sample of asbestos clothing for laundry calenders.—*Turner Brothers Asbestos Co., Ltd., Rochdale, Lancs.*



The new Development Department of Newton, Chambers & Co., Ltd. Here all the Company's engineering development activities are being centralised.

NEWTON CHAMBERS DEVELOPMENT

CONTINUED FROM P. 177

manufacture by Newton Chambers. The workshop is 35 ft. wide and 108 ft. long and has good natural light.

It is served by a three-ton overhead electrical crane controlled at floor level, and bus-bars throughout the full length of this workshop, with terminal points at every column, provide electrical power up to a capacity of 100 H.P. for driving compressors, fans and other equipment.

Machine tools have been installed for the preparation of test specimens and for the manufacture of small components for prototypes. On the first floor are the metallographic laboratory and X-ray dark room.

In charge of the new department is Mr. Edwin Watkinson, Chief Engineer, Development, who is the current Chairman of the Yorkshire Branch of the Institution of Mechanical Engineers.

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The new extension to the heavy construction shop not only caters for the growing demand for the Company's existing range of products, but also makes provision for new interests and projected engineering development.

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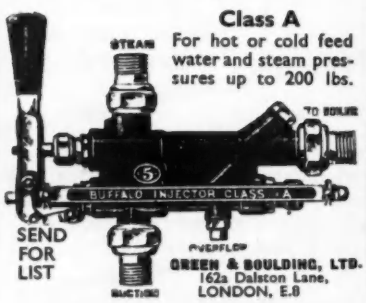

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SOUTHERN GAS BOARD

REGIONAL INSTALLATION SUPERINTENDENT —SOUTHAMPTON

APPLICATIONS are invited from suitably qualified persons for the post of Regional Installation Superintendent, Southampton.

Applicants should be conversant with service section organisation and administration, and have the ability to control District Inspectors and Fitters. Membership of the Institution of Gas Engineers, though not essential, would be an advantage.

The appointment will be within Grade 12 (£900-£1,025) of the National Salary Scales for Gas Staffs or Grades " A "-" B " (£1,025-£1,265) of the National Salary Scales for Gas Officers, and the starting salary will be dependent upon the qualifications and experience of the successful applicant.

The successful candidate will be required to pass a medical examination and unless already subject to a Pension Scheme by virtue of the Gas (Pension Rights) Regulations, 1950, will be required to join the Southern Gas Board Staff Pension Scheme.

Applications, to be made on special forms to be obtained from the Personnel Manager, Southern Gas Board, 164, Above Bar, Southampton, and returned upon completion, by May 10, 1957.

P. VALON BENNETT,
Personnel Manager.

COAL TAR PRODUCTS SALESMAN required. Good knowledge home and export markets, preferably under 35 years, but age no bar. Good salary and commission. Apply: No. 321, *Gas Journal*, 11, Bolt Court, Fleet Street, London, E.C.4.

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WEST MIDLANDS GAS BOARD

BIRMINGHAM & DISTRICT DIVISION
SHIFT SUPERVISOR
WINDSOR STREET WORKS

CANDIDATES must be fully qualified to take control of the whole of the Works during periods when day technical staff is absent. They should have had experience with continuous vertical retorts, automatic water gas plants, wet and dry purification, be conversant with the operation of boosters and exhausters and also understand the operation of gasholders. Experience in controlling labour is essential. The normal shift rota with a 48 hour week will apply. The Works has a productive capacity of 27 mills. cu.ft. of coal gas and 9 mills. cu.ft. of carburetted water gas per day.

The possession of a technical qualification such as a Certificate in the Technology of Gas Manufacture, or its equivalent, will be an advantage.

The salary will be within A.P.T. Grade 10 (£820 x 25—£920) of the National Salary Scales for Gas Staffs.

The post is pensionable, and the successful candidate may be required to pass a medical examination.

Applications, stating age, personal details, particulars of training, experience and qualifications, together with the names of two referees, should be addressed to Mr. J. E. Wakeford, Divisional General Manager, West Midlands Gas Board, Gas Offices, Edmund Street, Birmingham 3, to reach him not later than May 6, 1957.

J. C. INGRAM,
Secretary to the Board.

SCOTTISH GAS BOARD

CENTRAL DIVISION—PERTH DISTRICT
GENERAL WORKS FOREMAN

APPLICATIONS are invited for the above position at Friarton Gas Works, Perth. Applicants must have served an engineering apprenticeship and be experienced in the operation and maintenance of gas works plant and control of labour. The salary will be in accordance with Grade APT. IVa, Provincial ' A ' of the National Scales for Gas Staffs, £535-£615 per annum.

A modern house (three rooms and kitchen) adjacent to the works, will be available (rent and rates 22s. per week).

The post is pensionable, and the successful applicant will be required to pass a medical examination.

Applications, stating age and giving particulars of education, training, experience and qualifications, together with the names of two referees, should be addressed to the undersigned to reach him within 14 days of the appearance of this advertisement.

W. NICOL BAIRD,
General Manager.

Scottish Gas Board,
Central Division,
Gas Works,
Friarton,
Perth.

April 20, 1957.

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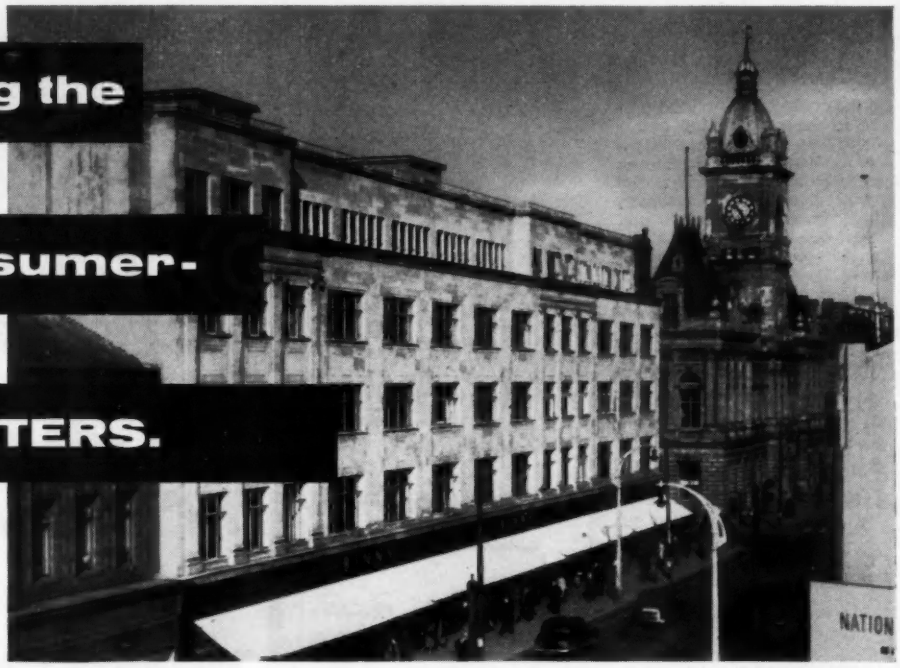

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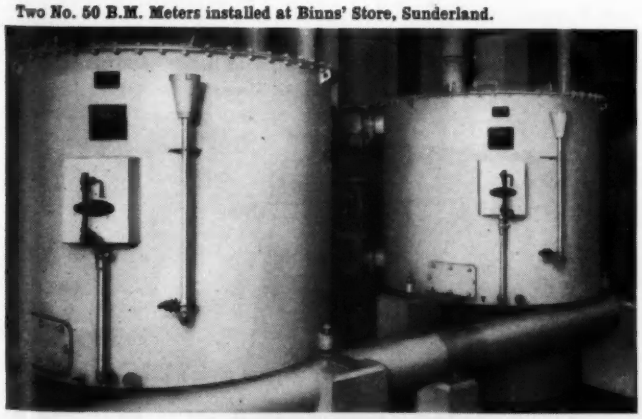

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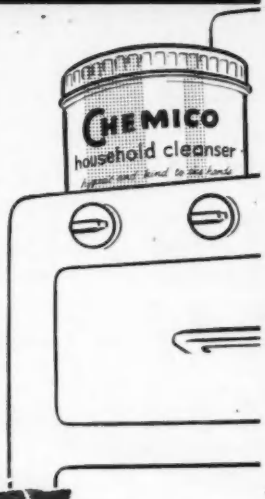

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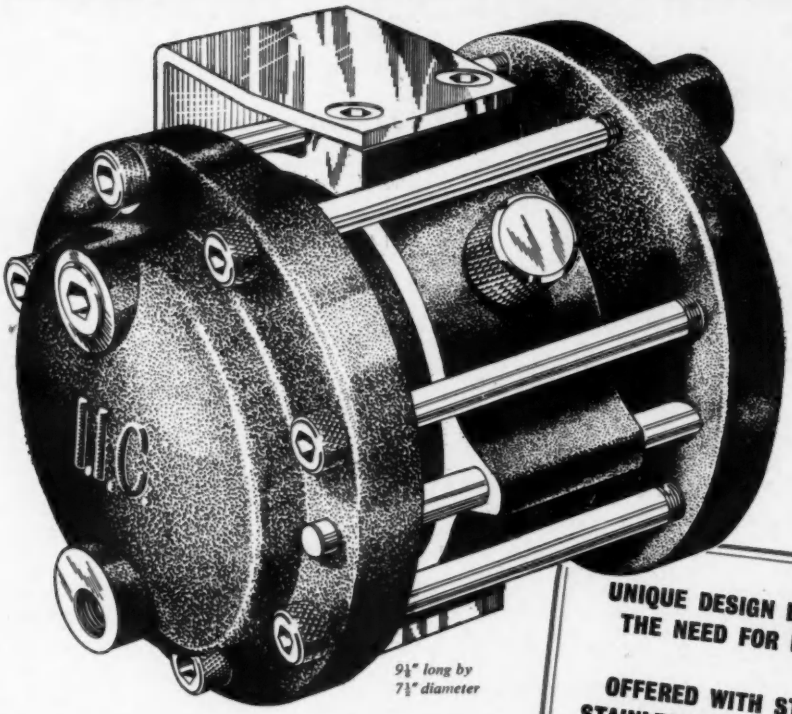

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